



MAP OF
CONCORD, MASS.

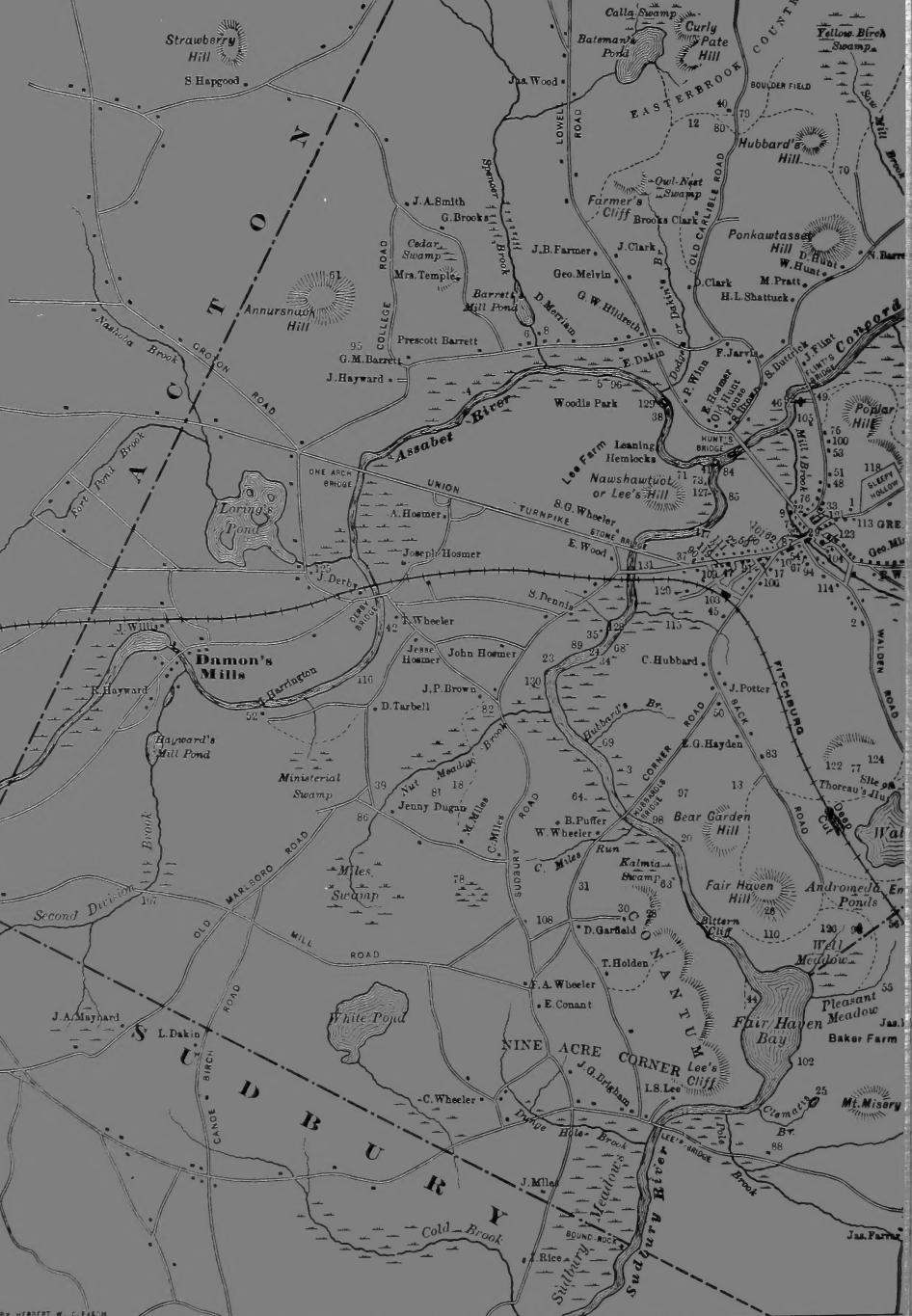
Showing Localities mentioned by
Thoreau in his Journals

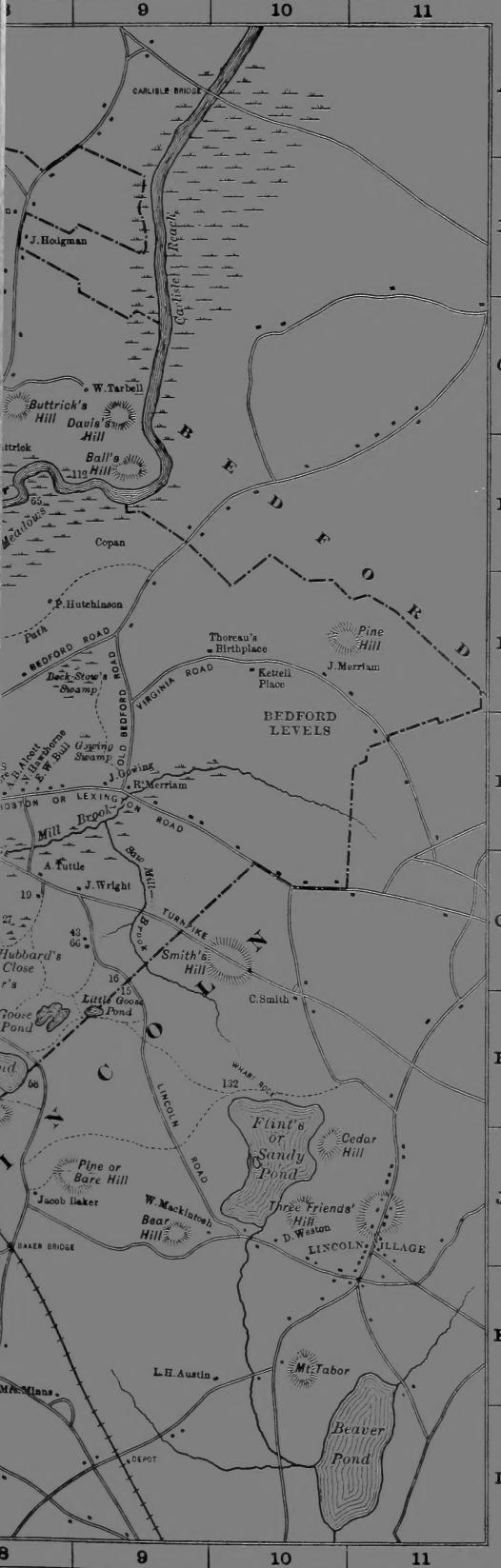
Compiled by Herbert W. Gleason
1906

SCALE OF MILES

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A





INDEX TO MAP OF CONCORD

Figures in parentheses correspond with figures on the map. A letter and figure combined indicate the space within which the locality may be found, this space being determined by the intersection of imaginary lines drawn from the corresponding letter and figure in the margin.

¹This name is spelled "Heywood" by Thoreau.

A FLORA OF CONCORD



THOREAU THE BOTANIST

"About half a dozen years ago I found myself attending to plants with more method. . . . I began to bring them home in my hat . . . which I called my botany box."

A FLORA OF CONCORD

An Account of the Flowering Plants,
Ferns and Fern-Allies Known to Have Occurred
Without Cultivation in Concord, Massachusetts
from Thoreau's Time to the Present Day

Richard Jefferson Eaton



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To
LUDLOW GRISCOM
(1890–1959)

“Ne quid quaeserveris extra te Concordiamque.”
(Seek nothing outside thyself and Concord.)

Attributed to Thoreau by William Brewster

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PREFACE

Because of its diversity of habitat and plant life Concord has attracted the attention of amateur and professional botanists for more than a hundred years. Despite the complete destruction of its ancient interglacial vegetation and soils by the last (Wisconsin) advance of Pleistocene ice in New England, and the resulting mantle of chiefly acid soils left behind by the retreating ice sheet, about eleven hundred species of vascular plants are well documented as having been found in the town. This number is almost exactly twenty per cent of the species described in Gray's Manual of Botany, 8th Edition, which covers the vast region roughly described by its four corners: Newfoundland, Minnesota, Missouri and Virginia. In addition, one hundred and fifty or more named varieties and forms are listed in the Catalog. Such a notable diversity within an area of twenty-seven square miles in temperate North America may be explained by the unusual combination of factors to be discussed in the introduction.

My continuing interest in the local flora has been sharpened since World War II by the rapid increase in the population of Concord and the accelerating destruction of its natural habitats. The subdivider and his bulldozer were on the march. A systematic botanical survey of the town seemed imperative before it was too late. This was accomplished for the most part during the nineteen-fifties, resulting in the documentation of many common plants and several rare ones previously overlooked or merely recorded.

The importance of authenticating the occurrence of plants by actual specimens, annotated with adequate collecting data, cannot be over-emphasized. The mere listing of plants observed in Concord by the knowledgeable Minot Pratt, for instance, is inconclusive. One must see concrete evidence that he correctly identified this or that fern, sedge, or aster. Thoreau left an herbarium. His identifications can be verified, but many specimens lack information about the place and date of collection. Therefore, they are unavailable for citation, with a few exceptions, even though most of them presumably were collected in Concord. A more detailed discussion of the Thoreau Herbarium and the problem it involves is to be found in the Introduction.

For convenience, other prefatory matter is included at the beginning of the Catalog.

This report on the vascular flora of Concord has been prepared primarily for students at the Concord Field Station of the Museum of Comparative Zoology, Harvard University. With a very few exceptions which are listed separately at the beginning of page 45, it is based on existing herbarium specimens of plants found growing without cultivation in the town, the oldest of which dates back to 1835. Many were collected by Thoreau and his friend Edward S. Hoar, mainly between 1855 and 1860. As a voucher, usually only one specimen is cited for each entry in the Catalog, it being the oldest coming to my attention. Unless otherwise stated, it is in the herbarium of the New England Botanical Club at the Harvard University Herbaria.

The aphorism appearing on page vii attributed to Thoreau by William Brewster is printed in *Rhodora* (Journal of the New England Botanical Club), Vol. 20, p. 205.

I am indebted to and thank the President and Fellows of Harvard College for permission to quote freely from Gray's Manual of Botany, 8th Edition; to Frank Conkling Seymour for the detailed information of plant distribution contained in his "Flora of New England." It is a pleasure to acknowledge the source of the end-papers as Gleason's map of Concord, which accompanies the first edition of Thoreau's Journal published by Houghton Mifflin Company. To Anton Kovar, my gratitude for the print of Thoreau, which is reproduced on the frontispiece. I am grateful as well to Ernst Mayr of the Museum of Comparative Zoology and of its Field Station at Concord for giving me an adequate reason for converting a card catalog into this report. I thank Reed C. Rollins, Director of the Gray Herbarium, for many favors, including out-of-hours access to the Herbarium; also Gladys I. Miner, former Curator, Herbarium of the University of Massachusetts, for the loan of specimens in her custody originating from Concord. Without the imagination and skill of Dorothy Z. Waleka in transcribing my handwritten manuscript to neat and accurate typescript, this work might never have been completed. I also pay tribute to Penelope Naumann for her editorial skill, which has proved indispensable. My life-long friend, Laurence E. Richardson, deserves particular recognition as the doer of chores, notably biographical research,

local botanical exploration, and discoverer of novelties. His knowledge of local history and of the location of unfamiliar place-names has been very helpful. My wife deserves praise for invaluable help in many ways and for keeping my nose to the grindstone. I have dedicated this book to my friend and noted ornithologist the late Ludlow Griscom, *not* as author of the Birds of Concord, but as a competent and stimulating botanist who exposed me to much of what he had learned in the field and herbarium from such eminent companions as K. K. Mackenzie, M. L. Fernald, and C. A. Weatherby.

INTRODUCTION

Concord is centrally located in Middlesex County, Massachusetts, about 18 miles WNW of the State House, Boston. It is roughly quadrilateral in shape, bounded on the north by Carlisle, on the east and southeast by Bedford and Lincoln, on the southwest by Sudbury, and on the west by Acton. The area thus included is about twenty-seven square miles.

The town was settled in 1635 by persons attracted by the abundance of meadow hay along the rivers, by the rich lowland soils derived from a slowly vanishing glacial lake, and by its several untilled corn fields, recently abandoned by the sparse Indian population. An added resource was the abundance of virgin pine and hardwood timber: white oak on the flanks of the six or more hills and drumlins, chestnut on the acid gravels of glacial kames and drift, white pine in many stands throughout the town. It was predominantly a farming community based on cattle, hay, and grain for over 200 years, gradually supplemented by sales of cordwood and market garden produce to the growing Boston market (1). Thus Concord became a compact village surrounded by scattered farms, with much arable land, pasture, and many woodlots, the latter harvested in rotation without destroying woodland habitats. Such a picture, undocumented for the most part, implies many hedge- and fencerows, ditches, woods-borders, yards, gardens, and tillage awaiting the early invasion of weeds from the Old World. All this expansion of what for many plants formerly had been restricted habitat must have had a profound effect on the original indigenous vegetation of the area. Habitats were provided for rare species to become common, and for species previously absent to invade the area. As will be noted elsewhere, presumed additions to the local flora have occurred within the last thirty years as a result of altered ecological conditions in the rivers and adjacent flood-plains (2).

GEOLOGY AND SOILS

The base-rock is metamorphic, consisting of successive beds of biotite and granitic gneisses, schists, quartz and gabbro-diorites, and contains a variety of mostly acid minerals. These beds were folded, base-leveled, and now are projected on the local U. S. geological map as bands of varying widths (1000 to

5000 feet) trending southwest to northeast. There are relatively few exposures, and those notably in the Conantum-Fairhaven Hill region and in the northern part of town. Two of the bands, known as the Marlboro Formation and the Salem-Gabbro-diorite, contain enough calcite in paper-thin layers to sweeten the soil significantly where it is exposed from Martha's Point to Lee's Bridge and westward to the vicinity of Garfield Road. Its buried northerly edge by-passes Fairhaven Cliff, the latter lying in the adjacent bed labelled granite gneiss on the current geological survey map. The influence of these exposures on the vegetation is discussed elsewhere. For the most part, the chemical nature of the underlying rock strata has little influence on the local flora. The last (Wisconsin) glaciation retreating from southern New England perhaps twelve to ten thousand years ago was the dominant factor in determining present-day soil conditions and in shaping the diverse physiographic features that characterize the town. The advancing ice sheet removed the ancient soils, scoured the drainage system and doubtless eroded many a cliff face. Later the rotting ice deposited its vast load of glacial debris chiefly in the form of loose rocks, boulders, clay, and more or less sorted gravels and sands. The action of glacial streams did much to rearrange this material into the eskers, kames and other more complicated surficial patterns which exist so conspicuously in the southeasterly and southwesterly quadrants of the town. Blocks of ice of varying sizes were buried by gravel, later to melt and form kettle holes big and small, and still later to become a Walden or Goose Pond, a quaking sphagnum bog or merely dry depressions. Another important result of the melting ice was the formation of a large shallow glacial lake centering in the lowlands surrounding the present-day village. The natural drainage northeasterly to the Merrimack River was blocked by a dam formed by the ice front, thus creating the lake and forcing the rivers to flow south into the Charles River. Apparently the lake was lowered in stages, perhaps three, before the ice-dam disappeared and the Concord River resumed its ancient direction. These events resulted eventually in an unusual variety of soils: sandy loams, alluviums, sandy peats, relict beaches and above all what have now become the extensive river meadows based on sandy clays with a deep overburden of peats and mucks.

PHYSIOGRAPHY

The area of Concord is twenty-seven square miles centering around the valleys of the Assabet and Sudbury rivers, which join at Egg Rock near the middle of the town to form the Concord River. The latter two streams are remarkably sluggish, dropping only two feet in the twenty-four miles between Wayland and North Billerica (3).¹ From Bound Rock at the southwest corner of the town to the Carlisle line the river trends NNE with many deviations caused by hills and bluffs. For the most part, it is bordered by meadows, notably the Great Meadows, two hundred or more acres in extent, which begin about a mile below Egg Rock. Much of this area was privately diked about 1928 to create shallow impoundments for a water-fowl refuge and later given over as a National Wildlife Refuge. The Assabet River is a narrower and swifter stream, flowing between narrower meadows and more numerous constrictive banks. It enters Concord from Maynard and Acton to the west.

The land for the most part is of low relief with the exception of the three major hills, the highest of which is 365 feet. The elevation above sea level varies from 112 feet along the Sudbury-Concord River to 200–250 feet in the northerly part of town. It seems not unreasonable to suppose that about half of this area lies below the 150-foot contour. The principal physiographic features follow, the names, where given, being those currently adopted by the U. S. Geological Survey, Concord Quadrangle (4), otherwise to be found on the map compiled by H. W. Gleason (5), accompanying the first edition of Thoreau's Journal (8) and reproduced here in the end-papers.

A. HILLS. (Heights stated to nearest 10-foot contour.)

Annursnack.

365 feet. Boulder-clay overlying rock core (?).

Fairhaven.

340 feet. Boulder-clay with exposure of Andover granite as a cliff on southerly side from summit to foot.

Punkatasset.

316 feet. Boulder-clay overlying rock core (?).

Nashawtuc.

250 feet. Drumlin.

¹A natural hard gravel bar a short distance above the dam at North Billerica is just two feet below the top of a similar bar in Wayland 25 miles upstream.

Hubbard's.

240 feet. Modified drumlin.

Pine.

230 feet. Drumlin.

Buttrick's.

210 feet. Modified drumlin.

Poplar (Ripley).

200 feet. Drumlin.

B. RIVERS.

Sudbury and Assabet to form the Concord at Egg Rock (5).

C. BROOKS. All except Elm drain into the three rivers.

Second Division (4),

including Hayward's Mill Pond (5) and two other artificial ponds.

Nashoba,

including Warner's Pond (artificial).

Spencer,

including Barrett's Mill Pond (5) (artificial).

Well Meadow (5),

drains Andromeda Ponds (5).

Hubbard's (5).

Dugan.

(Nut Meadow (5); Jenny Dugan.)

Mill,

including south branch of Saw Mill (5) and artificial ice-pond.

Cemetery (local name),

including artificial duck pond. Source: Moore's Swamp (5).

Saw Mill,

including artificial ice-pond. Source: Yellow Birch Swamp (5).

Elm, headwaters of,

draining through Bedford into Shawsheen River.

D. PONDS, natural.

White.

Forty acres. Subject to recent disturbance by abutting houses.

Bateman's.

Eighteen acres. Virtually unspoiled.

Goose, Little Goose.

Eleven and a half and one and a third acres. Both subject to periodic exsiccation, apparently correlated with low-water levels of Walden Pond. Partial destruction by future highway construction feared.

Walden.

Sixty-four and a half acres. Largest; deepest: 107 feet at high water (6). Exceedingly clear, mostly fed by springs. Thoreau has written interestingly of its changes in water level and other characteristics both physical and biological in a chapter of his book "Walden" entitled The Ponds (6).

Fairhaven Bay.

About seventy acres (6). Simulates an enlargement of the Sudbury River.

E. MEADOWS AND SWAMPS (5).

Sudbury Meadows, a small portion of, south of Lee's Bridge. Well Meadow, including Andromeda Ponds.

Miles Swamp, a misnomer on Gleason's map.

Ministerial Swamp.

Cedar Swamp.

Calla Swamp (misplaced on Gleason's map).

Yellow Birch Swamp.

Great Meadows (about 200 acres mostly under shallow water since 1928).

Moore's Swamp.

Beck Stow's Swamp.

Mill Brook meadows and tributary swamps, unnamed.

Hubbard's Close.

Andromeda Ponds, a chain of narrow, boggy swamps.

F. SPHAGNUM BOGS.

a. Bog, unnamed,

at westerly extension of Ministerial Swamp (5).

b. White Pond bog,

unnamed southerly extension of swamp in upper reaches of Jenny Dugan Brook, misnamed on Gleason's map as Miles' Swamp.

c. Miles Swamp (?) ; local name: Ledum Bog.

Now partially drained. Mislocated on Gleason's map.

d. Kalmia Swamp (5).

e. Gowing's Swamp (5).

f. Heywood's Meadow,

south of Walden Pond, draining into Fairhaven Bay.

CLIMATE

The town lies very close to the 20°F isotherm for the average minimum temperature of the coldest month, January. Being 25 miles west of the entrance to Boston Harbor its continental climate is considerably modified by proximity to the ocean, resulting in frequent wide fluctuations of temperature, particularly in the winter. Changes of 30° in 24 hours are not uncommon; of 50° and more, rarely. Similar variability in annual snowfall leads to winters lacking a continuous snow-cover and to much thawing and freezing. Occasional winter droughts may coincide with severe cold with sub-zero weather.

Much of Concord is low with poor air drainage. The average growing season is 144 days as measured by the average dates, spring and fall, for the last and first killing frosts. The latest known was June 21, 1918, and the earliest, September 2, 1886 (8). In the severe winter of 1903–04, low temperatures were officially recorded for December at –10°F; January, –26°F; February, –20°F. Snowfall was 62.2 inches and provided a continuous snow-cover for over ninety days (9). The winter of 1856–57 provides another example of the extreme variability of the Concord climate. On December 6, 1856, Thoreau noted that the river was generally frozen over and the ice would bear quite across in a few places. A severe cold snap began on January 16, 1857, not breaking until the 27th. On several days his dawn readings were –14° to –18° with an estimated low of –26°. Boston Harbor froze as far as Fort Independence and “thousands on the ice” were cutting a channel to the city (7).

Average annual precipitation is about 42.75 inches distributed almost uniformly month by month; for the growing season, 21.10 inches (8). Dry summers are infrequent; prolonged droughts for three or more successive years, rare. Exceptionally heavy summer rainfall resulting in flooded rivers occurs sporadically, perhaps as infrequently as every thirty to fifty years. The vegetational effects are discussed elsewhere. Snowfall varies between wide limits: *e.g.*, 94.1 inches during the winter of 1947-48 (November–February) and a continuous snow-cover from December 24–March 17. The following winter was exceptionally mild. December, 1948 — high, 55°, low, 7°; January, 59°, 7°; February, 61°, 2°. The average mean monthly temperature was 32.9°, or 8.0° above normal. The snowfall was only 22 inches up until the evening of February 28, 1949, with open ground bare about half

of each month (9). Dandelions were observed in full bloom in each of the three months.

Such a pattern of climate variability doubtless is an important factor in determining the absence or rarity of many species of perennial and woody plants.

COMPOSITION OF THE FLORA

The plant life of modern times is the resultant of two sets of influences: natural and human. Prior to 1650, say, the effect of disturbance by man may be safely ignored. Except for a few Indian clearings for dwelling sites and agriculture, and their burned areas, it is reasonable to assume that primeval conditions prevailed. The recapture of the postglacial gravels and sands, barrens, shallow lakes, and cold streams by vegetational types suited to such habitats was probably rapid. The latitude of the center of the town is $42^{\circ} 27'$. It is reasonable to postulate a temperate climate even when the retreating ice front was nearby, with hot summers frequently cooled by northwest winds from off the ice sheet, and cold, probably snowy winters. It is tempting to believe that the 20° isotherm had shifted southward significantly, but that the summer and winter temperature extremes were much the same as those recorded now. Doubtless northern forest species (poplar association), with the northern heaths occupying sphagnous depressions and pond-shores, were the first conspicuous elements of the advancing forest, providing humus and peat for herbaceous plants to push forward from the south and westward off the exposed but now drowned coastal plain. The next important episode was the melting of the ice-dam that had blocked the flow of the river into the Merrimack, thus permitting the drainage of Glacial-lake Concord and a resumption of the preglacial drainage pattern. Exposed sands, mucks, and peats suddenly provided a variety of habitats above and below floodplain levels for a lush vegetation. The transition to the primeval conditions alluded to above was now possible, although its time-scale, being still unknown, awaits investigation of peat horizons, pollen analysis and carbon-14 dating. Remnants of the postulated boreal flora still exist, chiefly in the cold sphagnum bogs. As the climate ameliorated a distinctly southern element crept in, the route unknown. This, too, is a feature of today's flora.

The dominant forest element in Concord for at least the past

three millenia has been the so-called oak-chestnut-hickory association with a lingering and perhaps an increasing (since 1000 A.D.) of species characteristic of the cooler upland forests of western and northern New England: hemlock, yellow and white birch, beech, striped maple (rare), sugar-maple (rare).¹ Before the land was cleared by the colonists for general farming, one may visualize a mature forest, broken only by river meadows, swamps, ponds and Indian clearings. Its understory must have been relatively free of shrubs and herbs, except in openings caused by blow-downs, fire, lightning and so on. For many species now common, suitable habitats were scarce.

The settlement of Concord (1636) by Old World immigrants soon converted virgin forest to tillage, pasture and wood-lot, the latter to be systematically harvested for timber, ship's masts, and firewood. An abundance of suitable habitat quickly became available for such woody plants as pitch pine (*Pinus rigida*), juniper (*Juniperus communis* var. *depressa*), red cedar (*J. virginiana*), willows (*Salix* ssp.), poplar (*Populus* ssp.), gray birch (*Populus populifolia*), alder (*Alnus* ssp.), scrub-oak (*Quercus prinoides*, *Q. ilicifolia*), shad (*Amelanchier* ssp.) hawthorn (*Crataegus* ssp.), blackberry (*Rubus* ssp.), cornel (*Cornus* ssp.), ericaceous shrubs: e.g., sheep-laurel (*Kalmia angustifolia*), huckleberry (*Gaylussacia baccata*), blueberry (*Vaccinium* ssp.), *Viburnum* ssp., elder (*Sambucus*), and many others. A proliferation of roadsides, borders of woods, fence-rows, ditches — even pasture and arable land — greatly expanded the habitats for a large number of indigenous native herbs, as well as for introduced and adventive weedy plants from the Old World which now constitute nearly one-quarter of the species listed in the Catalog. Some of our most conspicuous wild flowers are in this category, e.g., pasture barberry (*Berberis vulgaris*), meadow butter-cup (*Ranunculus acris*), white daisy (*Chrysanthemum leucanthemum*), and several species of hawkweed (*Hieracium*).

The agricultural phase of human disturbance in Concord lingered longer than in much of New England. Very few farms

¹This statement is based on well-documented evidence for an essentially modern woody flora at several sites in eastern Massachusetts, e.g.: (10), (11), (12). Lacking direct evidence for Concord, it seems reasonable to extrapolate. Raup's discussion of recent (i.e., within the last 3000 years) changes in climate and vegetation in southern New England is recommended; his bibliography is particularly valuable (10).

were actually abandoned as worthless in the 19th century. Except for a few truck farms on exceptionally fertile land, agriculture and dairying was virtually discontinued between the two World Wars (1918-1939). Many farms were purchased for country estates before the postwar inflation of land values (ca. 1950 and on), and later by subdividers for residential purposes. The transition to the rapidly growing town of 1974 with its large decentralized population was brief.¹ However, the full impact of large-scale housing development has not yet been felt. Furthermore, a large acreage has been withdrawn from private use. If the impoundments in the Great Meadows and floodplain easements deeded to the Concord Conservation Land Trust be included, over 25 percent of the area of the town (7 sq. miles) is presently considered safe from future disturbance.

Some irreparable damage has been done within living memory. The flooding of the sphagnum brook meadow on the old Calef farm near the junction of the Cambridge Turnpike and the highway (Route 2), destroyed a remarkable stand of *Arethusa* and *Menyanthes* (Buckbean). The housing development on Annursnack Hill and vicinity destroyed Grassy Pond and the only known station for *Cladium* (Twig-rush). Golf-course improvements at the Concord Country Club have apparently eliminated several scarce species: *Lycopodium inundatum*, *Calamagrostis cinnoides* (Reed-Bentgrass), *Calopogon* (Swamp-pink), *Gentiana crinita* (Fringed Gentian), *Bartonia virginica*. Repeated fires in Town Forest/Goose Pond/Walden Woods area depleted a large colony of *Adiantum pedatum* (Maiden-hair Fern) and *Hepatica americana*, and destroyed a small colony of *Linnaea* (Twin-flower). The partial drainage of Ledum Bog (Miles' Swamp (?)) and farming operations destroyed *Picea mariana* (Black Spruce) and its parasite, *Arceuthobium pusillum* (Dwarf Mistletoe), *Habenaria blephariglottis* (White Fringed Orchis), and *Ledum groenlandicum* (Labrador Tea).

Other locally rare plants which have disappeared include:

Pinus resinosa (Red Pine). Two small indigenous groves: one recorded by Pratt (15) at Merriam's Hill (Pine Hill), possibly cut down to improve pasturage; the other was destroyed by the removal of gravel from the ridge opposite Sleepy Hollow Cemetery, the last tree toppling down in the early 1900's.

¹Exclusive of inmates of Concord Reformatory, population in 1860: 2246; 1900: 4792; 1940: 7972; 1960: 12,517; 1970: 16,148.

Chamaecyparis thyoides (White Cedar). Two nearby stations: 1. Swamp, now overgrown with red maple, west of Strawberry Hill Road; 2. A small colony on west shore of Barrett's Mill Pond (Angier's) cut down about 1940.

Carex oligosperma. Occurred at Ball's Swamp north of Ball's Hill (5), which was flooded in the mid-1920's to make a pond for water-fowl.

Potentilla fruticosa (Shrubby Cinquefoil). This plant occurred in the small boggy (southern) end of Hubbard's Close (5) but was collected by E. S. Hoar after the construction of Fairyland Pond (now in the Concord Town Forest) nearly 100 years ago. The creation of the pond altered the level of the water table and gradually converted the boggy meadow to an alder/red-maple swamp, unsuitable for this species. It is chiefly a plant of calcareous soils, which suggests that formerly Brister's Spring (5) and up-welling ground water feeding the area may have been derived from aquifers in the nearby underlying calcium-rich Marlboro Formation (14). Present-day vegetation gives no hint of hard groundwater or sweet soil.

Cassia hebecarpa (Wild Senna). Destroyed by road-widening operations many years ago.

Circaea alpina (Enchanter's Nightshade). Occurred sparsely around Brister's Spring, which was temporarily filled in with muck and gravel from slumping road shoulders.

Asclepias verticillata (Whorled Milkweed). The last (?) remaining plant at Martha's Point disappeared about 1964. Much depleted by botanists in the late 19th century, and subjected to wear and tear by ever-increasing numbers of undiscriminating visitors.

Solidago speciosa (Showy Goldenrod). Destroyed by excavations at Clam Shell Bluff between 1935 and 1940. The station was probably identical with that of *Solidago stricta* mentioned by Thoreau in his journal entry of December 11, 1857. His specimen appears to be *speciosa*.

LOCALITIES AND HABITATS OF EXCEPTIONAL BOTANICAL INTEREST

At first, the feeling of a botanist visiting eastern Massachusetts is one of disappointment. He is likely to dub its flora as depauperate. He misses ubiquitous rich woods with their carpets of Bloodroot, *Hepatica*, *Claytonia*, as well as several species of

Trillium and orchids as common spring flowers. However, the region is compensated by the unusual number of different plant forms it possesses. Concord is particularly well favored in this respect. Its twenty-seven square miles harbor almost precisely twenty percent of the species occurring in the Gray's Manual range. This rather surprising fact is due largely to a combination of favorable ecological factors, among them being the diversity of habitats previously noted. Rock out-crops, the acid gravels underlying thin oak woods, north slopes of wooded eskers, ditches, brooks, natural ponds, the sluggish rivers with broad meadows and associated swamps, the deep loams of glacial lake bottoms and associated "fossil" sand beaches — all support a somewhat specialized flora. This section of the Introduction contains a selection of localized habitats with an annotated list mostly of the uncommon native plants associated with each. The vegetation of the rivers and river meadows is discussed in somewhat more detail.

ANNURSNACK HILL AND VICINITY

Adiantum pedatum (Maidenhair Fern).

Fide L. E. Richardson.

†*Cladium mariscoides* (Twig-rush).

Station destroyed about 1963.

Carex molesta

C. laxiculmis

C. blanda

Uvularia perfoliata (Bellwort).

Carya tomentosa (Mockernut).

Celtis occidentalis var. *pumila* (Hackberry).

Actaea pachypoda (White Baneberry).

Crataegus Holmesiana var. *villipes* (Hawthorn).

Rubus Enslenii (Blackberry).

Desmodium nudiflorum

Lespedeza virginica (Bush Clover).

L. intermedia

†*Acalypha virginica* (Three-seeded Mercury).

Viola pubescens (Downy Yellow Violet).

Fide L. E. Richardson.

Chimaphila maculata (Spotted Wintergreen).

Note: Daggers (†) preceding entries in the lists that appear in this section represent plants not known to occur elsewhere in Concord.

Moneses uniflora (One-flowered Pyrola).

Kalmia latifolia (Mountain Laurel).

Gentiana crinita (Fringed Gentian).

Not seen recently.

Menyanthes trifoliata var. *minor* (Buckbean).

Not seen recently.

†*Castilleja coccinea* (Painted Cup).

Apparently extirpated.

BATEMAN'S POND AND VICINITY

Isoëtes muricata (Quillwort).

Sparganium androcladum (Bur-reed).

Najas gracillima (Naiad).

Agropyron trachycaulum var. *glaucum*.

Northeast shore.

Trisetum spicatum var. *molle*

†*Eleocharis Robbinsii*.

Northeast end in shallow water.

E. olivacea.

Floor of skating rink, north end.

Carex laxiculmis.

East side.

C. projecta.

Chamberlin Woods. (22)

†*C. hirsutella*.

Chamberlin Woods.

Calla palustris (Wild Calla).

Chamberlin Woods.

Anemonella thalictroides

Crataegus Crus-Galli

Agrimonia gryposepala

†*Acer pensylvanicum* (Moosewood).

Ledges, east side.

Viola primulifolia var. *acuta*.

East side.

V. pensylvanica (Downy Yellow Violet).

Chamberlin Woods.

Sanicula marilandica.

East side.

Cornus florida (Flowering Dogwood).

Chamberlin Woods.

†Bartonia paniculata.

Shore-line, east side.

Lindernia dubia

Utricularia cornuta (Bladderwort).

U. gibba

CLAM SHELL BLUFF (Bank) (5)

(Including the ten-acre field above the Bluff)

This locality was the site of an important permanent Indian village, with a large shell-heap on the south-facing bank. It was under cultivation for many years prior to about 1930 and then allowed to become fallow. Some twenty-seven exotic plants, native to the Great Plains, became established, some abundantly so. The evidence suggests that they were inadvertently introduced with sheep manure purchased as fertilizer from a nearby woolen mill. The list is published in Rhodora (18), to which should be added *Bidens aristosa* var. *mutica*. Most of these plants persisted, despite increasing competition from rapidly growing weed-trees, until the site was almost completely destroyed by road and school house construction, as well as by subdivisions for house lots. The following plants are considered indigenous at this locality:

†Carex prairea.

A rare lime-loving sedge, its occurrence perhaps associated with leachings from the ancient Indian shell-heaps at this site.

Desmodium canescens (Beggar's-ticks).

Northeast limit of range at Concord.

Orobanche uniflora (Broom-rape).

†Solidago speciosa (Goldenrod).

The station apparently obliterated about 1940.

Aster pilosus var. *pilosus*

CONANTUM (5)

A. On the west side of the Sudbury River from Lee's Bridge north to include Martha's Point and Bittern Cliff (5) are narrow exposures of Salem Gabbro-diorite and Marlboro Formation (4), the latter containing paper-thin layers of calcite and occasionally small pockets of limestone. Similar outcrops occur along Garfield Road. An unusual number of locally uncommon

or rare plants usually but not always associated with circum-neutral soils have been found there. When Thoreau first began to take a botanical interest in plants, he noted in his Journal: "There is a little grove in a swampy place in Conantum where some rare things grow,— several bass trees, sassafras, maidenhair fern, the white-berried plant [probably White Baneberry listed below], and the sweet viburnum [probably *V. Lentago* L.] . . .", Thoreau Journal 2: 64. He was to become more discriminating in later years. The only rarities are Maidenhair Fern and White Baneberry, but he was already aware of Conantum as a good place for botanizing.

Botrychium virginianum (Rattlesnake Fern).

†*Pteretis pensylvanica* (Ostrich Fern).

†*Asplenium Trichomanes* (Maidenhair Spleenwort).

Adiantum pedatum (Maidenhair Fern).

Elymus virginicus (Wild Rye).

†*Hystrix patula* var. *Bigeloviana* (Bottle-brush Grass).

Agropyron trachycaulum var. *glaucum*

†*Muhlenbergia sobolifera*

Carex digitalis

C. blanda

†*Ulmus rubra* (Slippery Elm).

†*Parietaria pensylvanica* (Pellitory).

†*Ranunculus fascicularis* (Early Crowfoot).

Actaea pachypoda (White Baneberry).

Sanguinaria canadensis (Bloodroot).

†*Arabis canadensis* (Sicklepod).

†*Saxifraga virginiensis* (Early Saxifrage).

Vitis aestivalis var. *argentifolia* (Summer Grape).

†*Fraxinus nigra* (Black Ash).

†*Phryma Leptostachya* (Lop-seed).

†*Galium lanceolatum* (Wild Licorice).

†*Triosteum aurantiacum* (Wild Coffee).

†*Eupatorium sessilifolium* var. *Brittonianum* (Upland Boneset).

B. In addition to the foregoing species, there are a number of locally rare or scarce plants, less dependent on sweet soils, that have occurred on the Marlboro Formation or adjacent to it.

Woodsia obtusa

Cystopteris fragilis var. *Mackayii*

Asplenium platyneuron (Ebony Spleenwort).

Carex retroflexa

†*Isotria verticillata* (Whorled Pogonia).

Occurs outside of the Marlboro Formation area.

Corallorrhiza maculata (Spotted Coral-root).

†*Liparis liliifolia* (Lilia-leaved Twayblade).

Paronychia canadensis (Forked Chickweed).

Anemone virginiana

Desmodium glutinosum

†*Acer saccharum* (Sugar or Rock Maple).¹

Tilia americana (American Linden).

†*Aralia racemosa* (Spikenard).

Sanicula marilandica (Black Snakeroot).

Cornus florida (Flowering Dogwood).

C. rugosa (Cornel).

Moneses uniflora (One-flowered Pyrola).

†*Asclepias verticillata* (Whorled Milkweed).

†*Myosotis verna* (Spring Forget-me-not).

Gerardia pedicularia (False Foxglove).

Galium pilosum (Hairy Bedstraw).

Specularia perfoliata (Venus's Looking-glass).

Campanula rotundifolia (Harebell).

†*Eupatorium fistulosum* (Joe-Pye-weed).

EGG ROCK² AND ADJACENT AREAS

(At the confluence of the Sudbury and Assabet rivers.)

Panicum virgatum var. *spissum*

P. latifolium

Polygonella articulata (Jointweed).

†*Cerastium nutans*.

Not seen recently. Specimen in Thoreau Herbarium.

Crataegus flabellata var. *Grayana* (Hawthorn).

C. macrosperma var. *roanensis* (Hawthorn).

¹Presumably descendants of an indigenous grove mentioned by Minot Pratt (15). Of course, this species is abundantly naturalized from introduced nursery stock.

²Egg Rock is a large outcrop at the confluence of the Sudbury and Assabet rivers near the base of Nashawtuc Hill. To remind posterity of the vanished race which inhabited the region, this inscription was chiselled on the rock-face at the water's edge nearly one hundred years ago:

ON THE HILL NASHAWTUC
AT THE MEETING OF THE WATERS
AND ALONG THE BANKS
LIVED THE INDIAN OWNERS OF
MUSKETAQUID
BEFORE THE WHITE MAN CAME

C. Crus-galli (Hawthorn).

Viola pubescens (Downy Yellow Violet).

Not seen recently.

V. conspersa forma *conspersa* (Dog Violet).

— forma *Masonii* (White Dog Violet).

Fide R. J. Eaton; no specimen.

Cornus florida (Flowering Dogwood).

Fide Thoreau; not seen recently.

†*Rhododendron roseum* (Pink Azalea, Election-pink).

Kalmia latifolia (Mountain Laurel).

Apocynum cannabinum (Indian Hemp).

Fide Thoreau (18).

ESTABROOK¹ WOODS AND ABUTTING AREAS (5)

Athyrium thelypteroides.

"Lime-kiln road near Esterbrook place"; fide Pratt (15).

Adiantum pedatum (Maidenhair Fern).

No specimen survives.

Carex hirsutella (22).

Calla palustris (Wild Calla).

Anemonella thalictroides (Rue Anemone).

Anemone virginiana (Thimbleweed).

Actaea pachypoda (White Baneberry).

Geum canadense var. *camporum*

Viola pubescens (Downy Yellow Violet).

Cornus florida (Flowering Dogwood).

Asclepias exaltata (Milkweed).

A. purpurascens (Purple Milkweed).

†*Galium circaeans* var. *circaeans* (Wild Licorice).

Lonicera sempervirens (Coral Honeysuckle).

†*Antennaria Parlinii* (Pussy-toes).

†*Bidens discoidea* (Bur-Marigold, Beggar's-ticks).

GREAT MEADOWS IMPOUNDMENTS AND VICINITY

The impoundments are of recent construction, having been completed about 1929. Except during the spring freshets and

¹Thoreau spelled this word Esterbrook, which was his version of the spelling used by the farmer who settled there. For many years the town maintained the road sign reading Esterbrook Road. Recently, it has been officially renamed Estabrook Road to conform with the spelling thought to have been used by the Reverend Joseph Estabrook, one of the early settlers.

occasional river overflows at other seasons, the water is derived from Cemetery Brook and extensive leachings from the Concord filter beds. In consequence, it is circumneutral to slightly basic and relatively rich in nutrients, thus supporting a lush vegetation, both aquatic and in adjacent meadow land, which was not present prior to the pollution.

Potamogeton Berchtoldii var. *polyphyllus* (Pondweed).

P. gramineus vars. *gramineus* and *myriophyllus* (Pondweed).

P. Oakesianus (Pondweed).

Alisma triviale (Mud-plantain).

†*Phragmites communis* var. *Berlandieri* (Reed). Apparently a recent migrant from the Sudbury meadows near the lower Wayland bridge and well established as a small colony in an excavation for gravel for construction of a dike (ca. 1927). For a discussion of the prior status of this grass along the Sudbury River, see *Rhodora* 54: 135 (1952).

†*Echinochloa Walteri*. A southern species extending along the coast to eastern New Hampshire and in alkaline habitats inland to southwestern Quebec. Its appearance along the dikes of the impoundments may be associated with the basic character of sewage effluent. (See *Rh.* 50: 262, 1957).

Cyperus erythrorhizos. (See *Rh.* 60: 317, 1958).

†*Scirpus fluviatilis* (River-Bulrush). Probably another recent migrant from upstream in Sudbury and Wayland, where it occurs very locally at two stations. It is a species usually associated with circumneutral to basic muds.

S. atrocinatus (Bulrush).

†*S. Longii* (Bulrush).

Carex tribuloides (Sedge) (See *Rh.* 61: 294, 1959).

Carpinus caroliniana (Ironwood). Several mature trees in low woods bordering the lower impoundment.

†*Hibiscus palustris* (Rose-Mallow, Marsh Mallow). This showy plant of saline, brackish, or fresh marshes has occurred rarely along the banks of the Concord and Sudbury rivers from Lowell to Wayland. There are two clumps known to survive in Concord. Thoreau refers to a colony east of Heard's Pond, but it appears to have disappeared from this its most inland station along the northeastern limit of its range.

Peucedanum palustre. A recent discovery (1970) and the

second recorded station in New England, the first record to my knowledge being in 1958. *Peucedanum* is a genus not included in Gray's Manual.

PETER'S PATH (5)

(Filter-bed area and easterly along abandoned railroad.)

This region was the site of extensive pre-colonial Indian habitations. The soil is light sandy loam overlying gravels. Presumably several of the plants persisted to modern times on the disturbed open soils of the railroad right-of-way which parallels the Great Meadows and the adjacent filter beds.

†*Digitaria filiformis* (Finger-Grass, Crab-Grass).

Andropogon Gerardi (Beardgrass).

Carpinus caroliniana (Ironwood).

Low woods.

Polygonella articulata.

Formerly local and becoming weedy and widely dispersed along New England roadsides.

Cassia fasciculata (Partridge Pea).

Crotalaria sagittalis (Rattlebox); cf. (?).

Lechea temulifolia (Pinweed).

Gentiana Andrewsii (Bottle-Gentian, Closed Gentian).

Liatris borealis (Blazing-star).

Solidago odora (Sweet Goldenrod).

Sericocarpus linifolius (White-topped Aster).

THE THREE RIVERS

A. Assabet River¹

Prior to the closing of the large woolen mills in Maynard, this

¹The remnants of a remarkable grove of ancient hemlocks lean over the river's edge a short distance upstream from Egg Rock. Thanks to Laurence Richardson, I am able to repeat what Hawthorne wrote about them: "At one point there is a lofty bank on the slope of which grow some hemlocks, declining across the stream with arms outstretched, as if resolute to take the plunge." Margaret Fuller mentioned in her dairy "a trip to the Hemlocks with Waldo" [R. W. Emerson]. A beloved Concordian of the next generation alluded to these trees in a poem about the Assabet entitled "Floating Hearts" (*Nymphoides cordata*). His admirers cut this inscription on a nearby boulder at the foot of the bank!:

BENEATH THE HEMLOCKS GRIM AND GRAY
OUR BOAT DRIFTS SLOWLY ON ITS WAY
MEMORIAL
TO
GEORGE BRADFORD BARTLETT
1896
MOST COURTEOUS AND KINDLY GENTLEMAN
THE TENDER FRIEND OF ALL

river was rendered essentially sterile by chemical pollution. A few aquatics persisted at the mouths of brooks and near to its confluence with the Sudbury River at Egg Rock. No specific record exists of what species they were except for the locally rare *Potamogeton nodosus* E. S. Hoar (1887) and *Sagittaria subulata* var. *gracillima* that was collected by A. W. Hosmer prior to 1903 and by R. J. Eaton prior to 1930. The mills were closed in 1952. Within the short space of five years or less the animal and plant life became abundant throughout, including up-river occurrences of *S. subulata* and the riparian *Zizania aquatica* (Wild Rice). A detailed survey of the Assabet aquatics should be made and compared with a similar one of the Sudbury-Concord rivers, coupled with adequate present-day pollution data.

B. Sudbury River

Prior to about 1930, the Sudbury River was relatively unpolluted. Its waters and underlying marginal muds were slightly acidic. Except for occasional bars or muddy shallows the channel and its gravel bottom were clear. Along the marginal mud banks the indigenous submerged plants consisted chiefly of *Potamogeton* ssp.¹, *Najas flexilis*, *Elodea Nuttallii*, *Ceratophyllum demersum* (Hornwort), *Myriophyllum humile* formae *capillaceum* and *natans* (Water-Milfoil), *Utricularia inflata* var. *minor* (Bladderwort), *U. vulgaris* (Common Bladderwort), *Megalodonta Beckii* (Water-Marigold). Not included in the foregoing list were the uncommon or locally rare *Potamogeton gramineus* var. *myriophyllum* (1888), *P. Oakesianus* (1929), *Utricularia purpurea* (prior to 1893). Rising from this under-story were plants with floating leaves including *Polygonum amphibium* var. *stipulaceum* forma *fluitans*, *P. coccineum* forma *natans*, the two yellow pond lilies: *Nuphar microphyllum* and *variegatum* as well as their hybrid \times *N. rubrodiscum*, *Nymphaea odorata* (White Pond-lily), *Brasenia Schreberi*, *Nymphoides cordata* (Floating-heart). Along the shore, rooted in mud, large masses of *Pontederia cordata* (Pickerelweed) pushed out into

¹Eleven species of pond-weeds are well documented. Adequate field work under present conditions of gross pollution may well reveal the presence of unrecorded species and the absence of several previously collected. The present status of many river aquatics is uncertain. The presumed effect of river pollution is discussed in more detail in another context (see p. 20). The omission of *Lemma minor* (Duck-weed) is not an oversight.

relatively deep water with the less aggressive *Peltandra virginica* nearby. In shallow water and on muddy banks the following plants were more or less conspicuous: *Sparganium eurycarpum* and *S. americanum* (Bur-reed), *Alisma triviale* and *A. subcordatum* (Mud-Plantain), *Sagittaria latifolia*, *Acorus Calamus*, occasional stands of *Scirpus validus* var. *creber* (Bulrush) and *Juncus effusus* vars., *Polygonum amphibium* var. *amphibium*, *Ludwigia palustris* var. *americana*, *Proserpinaca palustris* var. *crebra*.

C. Concord River

Although the Concord River is merely a continuation of the Sudbury River, it is augmented by the Assabet at Egg Rock and was contaminated by it. The record suggests rather inconclusively that some of the aquatics of the slightly acidic Sudbury were less abundant, scarce, or even absent from the Concord. The following species may belong in this category: *Potamogeton gramineus* var. *myriophyllum*, *P. Oakesianus*, *Peltandra virginica* (Arrow-Arum), *Acorus Calamus* (Sweetflag), *Polygonum amphibium* vars., *Nymphaea odorata* (Pond-lily), *Brasenia Schreberi* (Water-shield), *Nymphoides cordata* (Floating-heart), *Megalodonta Beckii* (Water-Marigold). On the other hand, two species of *Potamogeton* are known from the Concord River but not from the Sudbury, viz.: *P. gemmiparus* (1886), *P. pulcher* (1886); also *Zizania aquatica* (Wild Rice). In general, the effect of Assabet contamination was conspicuous only for a mile or so downriver, when dilution from tributary brooks and springs became significant.

The vegetation of the three rivers appears to have been altered by pollution. In the mid-1930's *Lemna minor* became a conspicuous weed on the Sudbury-Concord rivers, vegetatively reproducing on a vast scale as it floated downstream and often covering the entire surface of the water. Formerly it was uncommon. The only indexed reference to the plant in Thoreau's Journal relates to its occurrence on Cape Cod. Minot Pratt (15), contrary to his usual practice, briefly described it and specified the locality, perhaps implying he had not seen it elsewhere. It is remembered as occasional in stagnant woodland pools and backwaters, but not on the river. Eaton (20) came to the tentative conclusion that its weedy behavior — continuing to the present time (1974) — was due to a large increase in sewage pollution,

which supplied the nutrients as well as the basic water on which the Lemnaceae thrive. This explanation seems to have been widely accepted. Correct or not, it seems to be a fact that ecological changes have occurred concurrently with increased pollution, whereby at least a few aquatics have become much less abundant and others have increased spectacularly. Significantly, a few species, previously unrecorded in the acidic environment of our rivers, are now present. Although the status of most of them before and after pollution is unknown, the following species, formerly common or abundant, have definitely suffered a major decline: *Najas flexilis*, *Acorus Calamus*, *Nymphaea odorata*, *Brasenia Schreberi*, *Ranunculus flabellaris*, *Nymphoides cordata*. It is probable that *Megalodonta Beckii* should be included in this category.

The following are plants known to have increased since 1930, including those previously unrecorded (the latter being indicated by an asterisk, or a dagger¹ or both) :

Typha americana

*†*T. angustifolia*.

Abundant in the lower impoundment at the Great Meadows Wildlife Refuge.

*†*T. glauca*.

Several large clones at same locality.

Sparganium eurycarpum

S. americanum

*†*Phragmites communis* var. *Berlandieri*

Zizania aquatica.

Becoming remarkably abundant in the lower Great Meadows impoundment by 1957, and rapidly increasing along the Assabet River in favorable locations (fide L. E. Richardson, 1969).

*†*Scirpus fluviatilis*.

First discovered in 1960 as three small but flourishing colonies in wet meadow near dike of lowest Great Meadow impoundment. It is a plant usually of a calcareous habitat, but abundantly indigenous in deep wet silt at the mouth of Heard's Pond in Wayland, and also associated with *Phragmites* in the meadow north of the lower Wayland bridge. Locally basic soil at each locality is presumed.

¹See note p. 11.

Spirodela polyrhiza.

Now abundant along the dikes of the Great Meadows impoundments, and presumably elsewhere.

Lemna trisulca.

First Concord collection in 1946.

L. minor (Duck-weed).

**Wolffia columbiana* (Water Meal).

First discovered in eastern Massachusetts in 1938 by Eaton (21). Now nearly ubiquitous, and massively abundant.

*†*W. punctata*.

First discovered in 1957 by C. E. Wood, Jr. and reported by Eaton. Locally abundant.

[*W. papulifera*.

Discovered in Concord River at Billerica in 1968 by W. D. Countryman (personal communication). Doubtless overlooked at Great Meadows impoundments.]

**Cabomba caroliniana*.

First discovered in 1968 as abundant in Fairhaven Bay by W. D. Countryman. This dangerously aggressive aquatic is adventive from farther south and has rapidly choked some ponds and quiet streams in Massachusetts. The earliest collection known in Massachusetts, according to B. N. Gates (22), was in 1930. It is now known from many scattered stations throughout the state.

Trapa natans (Water Chestnut).

This naturalized plant from Eurasia was first collected in the Concord River by E. S. Hoar about ninety years ago. Until the onset of major pollution, it was widely dispersed throughout, but sparsely distributed in small patches about one to four meters in diameter along the margin of the rivers. By 1948, *Trapa* became so abundant in certain stretches of the Sudbury River "that no water at all was to be seen except along the thread of the stream. In fact, the shallow parts looked like dry land and it was difficult to shove a canoe through it." This is a quotation from a letter to me in 1947 by Henry B. Bigelow, who lived beside the river for many years.

RIVER MEADOWS

The ecology of the river meadows is complex and the response to it often puzzling. The original settlers were attracted to Musketaquid by the abundant meadow hay which they and their

successors proceeded to cut annually as cattle food. This implies that the meadows were open grassy expanses in pre-colonial times. Between the two wars (1920–1940) mowing gradually ceased. Some meadows remained grassy but others developed alder-willow thickets with occasional elm and swamp oak (*Quercus bicolor*) gaining a foothold. Instances of the former are the extensive Sudbury Meadows above Sherman Bridge, and the smaller ones above Lee's Bridge on the Concord side of the river and below the bridge in Lincoln. On the other hand the narrow ones below Fairhaven Bay, the wider stretches below Heath's Bridge to the railroad bridge and again between Nashawtuc Bridge and Egg Rock are rapidly becoming obliterated, particularly the latter (except for a piece near the causeway which is still mown annually to provide good ice for skating). The construction of numerous causeways and bridges across the river has altered the flow of the river during high water by partial damming. This effect does not seem to cause a difference in conditions above and below the causeways. Why some meadows should remain grassy and others not, is a problem deserving study. There is also a tendency for Red Maple swamps to encroach on the upland borders of the meadows in certain places. This process seems to be held in check by occasional summer flooding, resulting in stagnant warm water lying over the tree roots long enough to kill the trees. Exceptionally heavy July/August rainfall from tropical storms occurs on the average of about, say, every thirty years. Dead and dying maple saplings are a disfiguring feature of the river landscape for a few years following.

The herbaceous vegetation of the meadows is diverse. Grasses are dominant, but the numerous sloughs and mud-holes caused by ice frozen onto the dead vegetation and lifted away with its burden of turf during the spring freshets, provide a habitat for many species that cannot withstand the competition of the lush meadow hay, which consists primarily of *Phalaris arundinacea* (Reed-Canary-Grass) with *Calamagrostis canadensis* (Blue-joint), *Spartina pectinata* (Slough-Grass), and *Sphenopholis obtusata* var. *lobata* in lesser abundance. *Leersia oryzoides* and other *Leersia* ssp. are frequent. Among the commonest sedges were and are *Eleocharis Smallii*, *Scirpus validus*, *S. cyperinus*, *Carex stricta* often occurring in large patches without forming stools, *C. crinita* vars. *crinita* and *gynandra*, *C. comosa*, *C. rostrata* var. *utriculata*, and *C. vesicaria* var. *mobile*. *Phalaris ap-*

pears to be much less abundant now than formerly in the Concord meadows. Were the Short-billed Marsh-Wren to make a come-back, a colony of this once abundant bird would be hard put to it to find the desired acre or more of its favorite grass for a nesting site.

Around and on the sloughs and mud-holes the most conspicuous plants may consist of *Sparganium eurycarpum* (Bur-reed), *S. americanum*, *Sagittaria latifolia* (Arrowhead), *Juncus* ssp. (Rush) especially *J. effusus* vars., *Polygonum* (Knotweed) ssp. especially *P. pensylvanicum* var. *laevigatum* (Pinkweed), *Rorippa islandica* vars.

In August, on the higher riverbanks and drier parts of the meadows *Asclepias incarnata* var. *pulchra* (Swamp Milkweed), *Eupatorium dubium* (Joe-Pye-weed), *Bidens cernua* and *B. frondosa* (Beggar's-ticks, Stick-tight) become a colorful feature with an occasional exclamatory wand of *Lobelia cardinalis* (Cardinal-flower) near the water's edge.

On September 28, 1967, the railroad end of the meadow beginning at Clam Shell Bluff was rapidly surveyed, the area examined being approximately one hundred meters square. Until 1920 or thereabouts it had been mowed annually. Except for occasional clumps of *Cephalanthus occidentalis* (Buttonbush) and *Salix nigra* (Willow) along the riverbank, herbaceous plants grew exclusively. In 1967, perhaps fifty percent of the area was occupied by dense thickets of *Salix* and *Cephalanthus* sheltering occasional trees of *Ulmus* (American Elm) and *Acer rubra* (Red Maple). The conspicuous vegetation included:

Thelypteris palustris (Marsh Fern).

Occasionally abundant in wet areas.

Onoclea sensibilis (Sensitive Fern).

Abundant in drier sections.

Typha latifolia (Cattail).

Scattered small patches. Not present prior to onset of pollution.

Sparganium eurycarpum.

Scattered colonies on riverbanks, in ditches and muddy places.

S. americanum.

As above.

Spartina pectinata.

Rather common.

Phalaris arundinacea.

Formerly dominant, now much less abundant, the decline possibly owing to a basic environment resulting from sewage pollution.

Leerzia oryzoides.

Scattered plants throughout.

Scirpus validus var. *creber*.

Conspicuous clumps in mud or shallow water.

Carex stricta.

Large patches, often to exclusion of other vegetation.

Pontederia cordata (Pickerelweed).

Large clumps in shallow water along shoreline.

Salix nigra.

Forming numerous thickets up to six meters high.

Boehmeria cylindrica (False Nettle).

Frequent in shade of *Salix* and *Cephalanthus*, where less competition.

Polygonum coccineum.

Frequent near riverbank.

P. punctatum.

Frequent in muddy places.

P. pensylvanicum.

Frequent on exposed mud.

P. scandens.

Frequent climber on *Cephalanthus*, etc.

Lysimachia terrestris.

Scattered among the *Phalaris* and *Carex stricta*.

Asclepias incarnata var. *pulchra* (Swamp Milkweed).

Abundant in meadow openings and along riverbank.

Cephalanthus occidentalis (Buttonbush).

Forming impenetrable thickets up to four meters high.

Eupatorium dubium.

Dense colonies in drier locations; also scattered along riverbank.

Bidens cernua.

Abundant.

B. frondosa.

Abundant.

The foregoing is a sampling of a small piece of meadow rapidly losing much of its herbaceous character. Frequent or even common species in other meadows not previously mentioned include:

- Equisetum fluviatile* (Water-Horsetail, Pipes).
Rumex orbiculatus (Water-Dock).
Penthorum sedoides (Ditch-Stonecrop).¹
Chrysosplenium americanum (Golden Saxifrage).
Rosa nitida
R. virginiana
R. palustris
Acer saccharinum (Silver, Soft, or River Maple).
 Common along the banks of the Great Meadows.
Proserpinaca palustris vars. (Mermaid-weed).
Cicuta bulbifera
C. maculata
Sium suave (Water-parsnip).
Vaccinium macrocarpon (Cranberry).
 Generally distributed in sphagnous areas.
Lysimachia terrestris (Swamp Loosestrife).
L. Hybrida
Eupatorium perfoliatum (Boneset).
Solidago ssp. (Goldenrod).
Aster ssp.
 Often abundant.
Sericocarpus asteroides (White-topped Aster).

Occasionally, in the higher edges bordering the upland, may be found small cranberry bogs on acid peat where *Pogonia ophioglossoides* occurs sometimes abundantly, and, rarely, *Iris prismatica*. Expected associates may include *Eriophorum virginicum* (Rusty Cotton-Grass) and species of two *Rhynchospora*: *R. alba* and *R. capitellata*. In the open meadow above Lee's Bridge is an interesting stand of *Potentilla palustris* (Swamp Cinquefoil) covering perhaps one-quarter of an acre to the exclusion of other vegetation!

Other common, local, or rare species not previously mentioned are:

- Carex lasiocarpa* var. *americana*
Viola Brittoniana.

Usually restricted to a narrow strip at edge of normal high water.

¹Recent search for this plant in localities where it is known to have occurred was fruitless. Perhaps this species also is a casualty of pollution.

Ludwigia alternifolia.

Known only from bank of Assabet River near mouth of Spencer Brook.

Sicyos angulatus (Bur-Cucumber).

A climber on shrubs, etc.

Echinocystis lobata (Prickly Cucumber).

Habitually similar to preceding species.

Vernonia nove-boracensis (Ironweed).

Abundant at a single locality near Flint's Bridge.

Mikania scandens (Climbing Hempweed).

An uncommon climber on *Cephalanthus*, etc.

Second Division Brook and Vicinity

Taxus canadensis (American Yew).

Habenaria fimbriata (Large Fringed Orchis).

Tephrosia virginiana

Rhus vernix (Poison Sumac).

†*Epigaea repens* var. *glabrifolia* (Mayflower).

Gentiana clausa (Bottle-Gentian).

Apocynum medium (Dogbane).

†*Viburnum trilobum*

SPHAGNUM BOGS¹

A sphagnum bog in this context may be thought of as a pond, big or little, partially or completely covered with a dense mass of floating vegetation mainly of wet sphagnum moss in which are embedded herbs, shrubs, and trees requiring or tolerating a wet, acid environment. Thoreau described Gowing's Swamp (5) in detail with sketch maps in two entries in his Journal (16), giving physical measurements and listing the plants he found growing there (16). Eaton (17) has briefly summarized Thoreau's findings, adding supplementary information. Referring to Ledum Bog (C), Pratt (32) in his essay on Flowers and Flower Culture prophetically wrote 100 years ago: ". . . in a small shaking bog, all within the space of two square rods *Ledum latifolium*, *Andromeda polifolia*, *Kalmia glauca*, the White Fringed Orchis, all beautiful and rare, are now to be

¹For names, identifying letters and locations see Introduction, p. 5 under Sphagnum Bogs. No single bog contains all the plants listed below; a few species have been found in only one or two of them. The letters at the end of each entry indicate the bogs in which the plant occurs; *sb* preceding an entry denotes the occurrence of the plant in Concord only in a sphagnum bog.

found, though the vandal who claims to own the bog is rapidly pushing his improvements in such a direction as to threaten destruction of the worthy tenants of his soil." For a brief reference to more recent disregard for rare plants by a later owner of this bog see Eaton in *Rhodora* 37: 413 (1935). As of 1955, the *Ledum*, *Kalmia*, and the White Fringed Orchis (*Habenaria blephariglottis*) had disappeared, as had Black Spruce (*Picea mariana*) and Dwarf Mistletoe (*Arceuthobium pusillum*).

Woodwardia virginica (Chain Fern). B, C.

Picea mariana (Black Spruce). B, C, E.

Larix laricina (American Larch). B, D, E, F.

Scheuchzeria palustris. A, E.

Thoreau (15) describes the plant accurately, stating it to be abundant in Gowing's Swamp. It has either been overlooked there or has disappeared in recent years.

Trisetum pensylvanicum. F.

sb Eriophorum spissum (Hare's-tail). B, E.

Carex seorsa. F.

Calla palustris (Wild Calla). E.

Habenaria blephariglottis (White Fringed Orchis). C.

Pogonia ophioglossoides. F.

Calopogon pulchellus (Grass Pink). F.

†*Arceuthobium pusillum* (Dwarf Mistletoe). C.

Drosera rotundifolia (Sundew). General.

D. intermedia. C, and probably elsewhere.

†*Ledum groenlandicum* (Labrador Tea). C, formerly rather abundant; station now destroyed.

Rhododendron viscosum forma *glaucum*. C, E.

sb Kalmia polifolia (Pale Laurel). C, D, E.

sb Andromeda glaucophylla (Bog-Rosemary). C, E.

Gaylussacia dumosa (Dwarf Huckleberry). C. E fide Thoreau. There is a specimen in the Thoreau Herbarium which may have come from either bog.

G. frondosa (Dangleberry). E, probably elsewhere.

sb Vaccinium oxycoccus (Small Cranberry). B, E.

V. macrocarpon (American Cranberry). General.

— forma *microcarpon*, an unpublished herbarium name. E.

sb Menyanthes trifoliata var. *minor* (Buckbean). E fide Thoreau. F.

Utricularia geminiscapa (Bladderwort). C.

SUMMARY OF BOTANICAL ACTIVITY

The recorded history of Concord botany appears to begin with the Jarvis brothers, Charles (1800–1826) and Edward (1803–1864), both born in Concord and both graduates of the Harvard Medical School, where courses in botany were required. Charles died after only three months of practice. His herbarium was incorporated with that of Edward, whose interest in plants continued for many years. In 1858 the Jarvis collections were deposited by Edward in the "State Cabinet" under the jurisdiction of the Secretary of Agriculture of Massachusetts and eventually found their way to the herbarium of the University of Massachusetts at Amherst. Most of the specimens representing 773 species of vascular plants listed in the Annual Report of the Massachusetts Board of Agriculture for 1859 "were collected by Dr. Edward Jarvis and Charles Jarvis" (23). Of these, ninety-seven, including five cultivated items, are labelled as from Concord, many precisely located (23). The names of the collectors of eleven of the specimens are given. They are absent from all the others, although in five cases a companion is named. Undoubtedly, Edward was the collector, as the dates range from 1833 to 1836. He had returned to Concord in 1832 and lived there until 1837 (24). The oldest specimen is *Viola conspersa*, collected by "C. [Charles] Jarvis, Concord Turnpike, May 25, 1823."

Dr. Edward Jarvis was a man of considerable reputation. An autobiography written by him in the third person in longhand is owned by the Houghton Library, Harvard University. My friend, Laurence E. Richardson, a noted student of Concord history, very kindly brought the following quotation to my attention. It reflects Jarvis's methodical procedures. The herbarium that he describes must have been extensive, one-third having been collected by his older brother, Charles. What happened to it is a mystery. There is no mention of it in his will, nor have we been able to find a clue to its disposition. Obviously, it has nothing to do with the material at Amherst. After graduation from college (1827) he taught school in Concord and

"studied much botany this year. . . . gathered and analyzed most of the plants of Concord. . . . Before he went to Boston for a course of lectures he arranged all the flowers he had gathered and pressed according to the Linnaean classification into an herbarium. He had

large sheets of coarse, brown paper, tarred, which would preserve the plants from insects. The plants were all labelled with the class, order, genera and specific name, generally with the place of growth and date of gathering, and with many, some incident or circumstance connected with it, as the companion of the time, etc. In making up this herbarium, Jarvis took first his brother Charles' plants which were most of the plants which are found in eastern Massachusetts."

The next person in the botanical records of the town is Thoreau (1817–1862). In a journal entry for 4 December 1856 (25), he mentioned that his first botany book was "Bigelow's 'Plants of Boston and Vicinity'" which he began to use when he was about nineteen years old, "looking chiefly for the popular names and the short references to the localities of plants," but without regard to the plant itself. His scientific interest in them began "about half a dozen years ago [when] I found myself again attending to plants with more method, looking out the name of each one and remembering it." This corresponds to what appears to be his first use of the Latin name for a plant in May or June 1850: "*Prunus depressa* Pursh" (Th. J. 2: 12). Despite the fear he expressed fifteen months later that his knowledge was becoming more scientific year after year, his journal reflects a growing interest in plant identification and distribution, an interest not confined to Concord. He mentions a few plants observed on Mt. Wachusett in October, 1854, and many during his trip to Cape Cod in July, 1855 (26). His list of plants that he found on Mt. Washington (27) is meticulously arranged in six zonal categories according to altitude, and in more detail than his inventory made for Mt. Monadnock the previous month. His account of his visit to Monadnock in August 1860 (28), well illustrates his preoccupation with natural history, particularly botany. The list of articles he carried on this excursion included a microscope, plant book (his equivalent of a field-press), blotting-paper and a Botany (presumably Gray's Manual 5th Ed.).

In retrospect, and to judge only from Journal entries, Thoreau the Naturalist begins to compete with Thoreau the Philosopher in 1852, to the latter's evident distaste. By 1857 botany has achieved intellectual status and is emotionally acceptable. Considering his lack of adequate optical instruments, his lack of

professional guidance and professionally annotated herbarium material for purposes of comparison, his taxonomic competence seems to have developed rapidly to a remarkable degree. His capacity for keen observation both in the field and at the desk, and his careful attention to the need for accuracy were contributing factors in achieving the status of a good amateur botanist. Presumably, his friend, fellow townsman, and frequent companion in the field, Edward S. Hoar, was a stimulating influence. Just when Thoreau started his herbarium is uncertain, probably in 1850 when he collected an *Andropogon*, a *Carex* and a *Juncus*. It was about that year when he "began to bring them [plants] home in my hat, a straw one with scaffold lining in it, which I called my botany box" (25). The scaffold lining is also described in an entry for 23 June 1852, as made by gathering it mid-way so as to make a shelf, thus preserving his plants in the dark during a long walk. Presumably moisture from his brow helped. Despite his satisfaction with his improvised vasculum, its small size tempted him to collect small incomplete specimens, to the detriment of his herbarium.

After Thoreau's death, and at his request, his grasses representing ninety-four species and two varieties were given to Edward Hoar and the remainder to the herbarium of the Boston Society of Natural History. The term "grasses" was liberally interpreted, for Hoar apparently received all of the Cyperaceae, Juncaceae, and a few other plants which bore grass-like leaves. After Hoar's death, his daughter, Mrs. Florence Hoar Bradford, presented her father's excellent herbarium, including the Thoreau collections, to the New England Botanical Club. These were carefully mounted on standard-sized sheets with Thoreau's nearly illegible slips of paper and Hoar's translation of them, and incorporated in the Club's organized herbarium. Many bore a collection date and a locality such as Poke-logan, Bittern Cliff, Well-meadow and so on, these being Thoreau's private place-names and easily identified as of Concord. Occasionally, specimens were erroneously attributed to Concord by Prof. M. L. Fernald, who had given them their correct, modern scientific names. These have been eliminated from the Catalog.

Other specimens were named by Thoreau but lack annotation. If common in Concord, it is assumed that they were collected in Concord, an assumption reasonably valid because he habitually (but not always) dated and annotated plants collected elsewhere

or sent to him by friends. An unannotated specimen of a plant not subsequently found in Concord is also eliminated from the Catalog; usually its exotic origin is obvious.

The much larger portion of the Thoreau herbarium, representing about seven hundred species and twenty varieties,¹ was catalogued by a staff member of the Boston Society of Natural History. He used the same nomenclature and sequence followed by Thoreau, which was that of Gray's Manual of Botany, 5th Edition. Numerous specimens were collected outside of Concord, the place of origin usually being written on scraps of paper; others lack annotation, but are obviously in the same category, such as salt-marsh plants and arctic-alpines. A number of specimens, usually of considerable interest, are annotated with Thoreau's local place names and clearly of Concord origin. Occasionally a significant specimen, annotated with a date only, may be assigned to Concord with confidence if the Journal indicated that Thoreau was in Concord throughout the day of collection. Of the remaining specimens that lack adequate collection data, only those representing plants known to have occurred in Concord are included in the Catalog. In 1880, the Natural History Society gave the herbarium to the Concord Free Public Library, where it remained under wraps for many years. Eventually, the Library gave it to Harvard University for deposit at the Gray Herbarium where it could be properly cared for in an air-conditioned insect-free building. Although accessible by appointment to interested persons on written request to the Curator, the specimens are as Thoreau left them, fragile and insecurely mounted, and should be handled with extreme care. Casual visitors, wishing merely to satisfy their curiosity, are discouraged from examining them.

Sophia E. Thoreau (1819-1871), according to several biographers and to evidence derived from the Journal, was of considerable influence in persuading her brother to take a scientific interest in botany. She was musical, artistically inclined, and fond of flowers. The last trait extended to wild flowers. According to an entry in the Journal on 22 September 1852, "Sophia has found in Concord which I have not seen this summer *Polygonia* [= *Isotria*] *verticillata*, Hubbard's Second Wood, *Trillium*

¹The exact number has not yet been ascertained. Several specimens were erroneously considered by Thoreau to be identical with previous collections; a few others were misidentified according to modern ideas and are duplications.

erythrocarpum [= *undulatum*], *Uvularia perfoliata*." These are rare plants, two being known today from single stations only, the third (*Trillium*) was last collected in 1901 from an unknown locality. Sophia had a keen eye indeed, and must have been an assiduous explorer in the town. What happened to the *Isotria* is a mystery. The other two are represented by unnamed and unannotated specimens contained in a bundle of seventy-six mounted sheets of plants in the Concord Public Library bearing a covering statement that they "are part of the working Herbarium of Henry D. Thoreau given by Miss Sophia Thoreau after her brother's death to Miss Eliza Hosmer. . ." They were given to Middlesex School by the latter's nephew, but subsequently sold to the Thoreau Society and placed in the Library for safe-keeping. Sophia evidently considered them her property; otherwise, she was in duty bound to turn them over to the Boston Society of Natural History. Aside from nineteen sheets of miscellaneous leaves, four specimens are annotated as from outside of Concord and one from Sleepy Hollow, which is the name of a cemetery in Concord. The remainder including *Quercus prinus* (Chestnut Oak), which recently has also been discovered at the eastern base of Fairhaven Hill, bear no collection date, but presumably were found in Concord, with the probable exception of *Houstonia longifolia*. Among them are two plants never recorded from the town: *Habenaria hyperborea* var. *huronensis* (Leafy Northern Green Orchis) and *Gaultheria hispida* (Creeping Snowberry). These are not listed in the Catalog, their origin being uncertain.

Edward Sherman Hoar (1823–1893), a grandson of Roger Sherman, a signer of the Declaration of Independence, was a native of Concord and brother of two distinguished practising lawyers: one a judge of the Massachusetts Supreme Court and U.S. Attorney General in the Grant administration, the other becoming a Senator from Massachusetts, serving in Washington in that capacity for thirty years. Edward, a botanist at heart, was also a lawyer, practising in his native town, with an interlude in California during the gold rush. He and Thoreau, six years older, were intimate friends and companions on numerous botanical field trips at and away from home, notably to Mt. Monadnock, the White Mountains, Mt. Katahdin, and the Maine woods. He made an important contribution to our knowledge of the local flora of a century and more ago, especially of the

grasses and sedges. His herbarium was presented to the New England Botanical Club by his daughter, Florence Hoar Bradford, and annotated and remounted under Fernald's personal direction. In addition to the ninety-four species and two varieties which he inherited from Thoreau, three hundred and fifty-six species, twenty varieties, and three named forms are cited in the catalog. Unlike his friend, he annotated his specimens legibly and for the most part included precise and ample data. By far the larger number were collected during the years 1857 through 1860; the most recent two appear to be *Spartina pectinata* in 1887 and *Juncus acuminatus* in 1890. Because of the uncertainty of the place of origin of most of Thoreau's plants, priority of citation in the Catalog is frequently accorded to Hoar. He showed an unusual interest in *Salix*, often correlating the flowering, fruiting and mature leafy states of each sex of a species by the then uncommon practice of tagging and collecting from individual plants at appropriate seasons.

Horace Mann, Jr. (1844–1868) appeared on the botanical scene of Concord when he and his widowed mother moved there in 1860. His competence as a naturalist quickly attracted Thoreau's attention and led to a collaboration in the identification of plants, birds and small mammals. A year later, at the age of seventeen, he accepted an invitation from Thoreau to accompany him on the ill-advised trip to Minnesota which Thoreau's doctor had recommended in a vain attempt to restore his rapidly deteriorating health.¹ Prior to Mann's premature death at the age of twenty-four, he made significant collections as far afield as Hawaii and had published some of his discoveries. Letters to his mother in 1861 refer to packages of plants sent home from Minnesota. In 1866, he was employed by a local committee headed by R. W. Emerson, Judge E. R. Hoar and others, to prepare and install a collection of twelve hundred plants in the Library. He nearly completed his obligation before his death, the deficiency being made up by his mother with specimens collected by him elsewhere in America. A few years ago the Library gave Mann's so-called Concord Herbarium to the Gray Herbarium of Harvard University for disposition at its dis-

¹Horace's letters written to his mother during the trip have been edited in their entirety by Walter Harding and appear in Thoreau Society Booklet No. Sixteen, Geneseo, N.Y., 1962, under the title "Thoreau's Minnesota Journey: Two Documents," the first being Thoreau's very interesting notes on his journey west, and the second, the letters.

cretion. The New England plants were given to the New England Botanical Club. Among the latter are forty-seven additions to the documented flora of the town.

Minot Pratt (1805-1878) was a horticulturist (a lover of the growing plant) with botanical instincts and as such played an important role in stimulating his more scientifically minded contemporaries and successors. After an elementary school education, he was apprenticed to a printer in New Bedford; worked in Chelsea and Boston; spent four years at Brook Farm as its Treasurer, learning the art of growing produce for home consumption and marketing the surplus; and then moved to Concord to establish himself as a beloved farmer-naturalist, to use Frank Sanborn's phrase. He was admired by Thoreau, who frequently alluded to him in the Journal. His name also appears in the Emerson, Hawthorne, and Louisa Alcott journals. Also while at Brook Farm he studied botany to further his horticultural pursuits. From his frequent walks about town with Thoreau, he gained a surprisingly detailed knowledge of its native flora. As a hobby, he tried to naturalize plants from many sections of temperate United States, placing them in such skillfully chosen sites that many persisted for years. This questionable practice presented an awkward problem to a later generation of botanists, who were faced with the question as to whether a local rarity was truly native to Concord or not. Luckily, he left a record of most, if not all his introductions in a manuscript that may be found in the Concord Free Public Library (15). Their status in 1899, as known to A. W. Hosmer, was published in the first volume of *Rhodora* (29). At the request of friends, he prepared an annotated list of the wild plants of Concord (15), indicated their status, and, in many cases, where they were to be found. For example, a grove of sugar maples (*Acer saccharum*) near the district school house at Nine Acre Corner is listed as indigenous and the only such he knew about in town. His list contains a few mistakes, as, for instance, his allusion to *Parietaria pensylvanica* (Pellitory) as common, whereas it is one of the very rare plants of Massachusetts east of the Connecticut River valley. He may have confused Pellitory with Three-seeded Mercury (*Acalypha rhomboidea*), which superficially resembles it. He listed the Long Beech-Fern, his *Phegopteris polypodioides* (= *Dryopteris Phegopteris* (L.) Christens.) as common. It is exceedingly rare in Concord, if indeed it is still present, being

known from a single collection by Hosmer more than seventy years ago. Another entry reads "*Abies alba* (White Spruce). Common in swamps." It is uncertain what Pratt had in mind, certainly not *Picea glauca* (Moench) Voss (the White or Cat-Spruce of northern New England). He evidently confused *Good- yera repens* (L.) R. Br. var., which is local (Norfolk Co., Mass.) in New England except in the north and west, with the locally rare Rattlesnake Plantain, *G. tesselata* Lodd., which he had found in Walden Woods and in the Punkatasset Hill region. As far as is known, he did not leave an herbarium; probably he did not make one. George Bartlett, in his Concord Guide Book (30), implies that he believed Pratt to have introduced the now rampant Water-Chestnut (*Trapa natans*) and *Marsilea quadrifolia*. Contemporary evidence is lacking as to *Trapa*. Hoar, on a collection label dated 1879, attributed the *Marsilea* introduction to him.

Walter Deane (1848–1930), an enthusiastic amateur botanist of Cambridge, collected in Concord around the turn of the century during his ten years' association with the noted ornithologist William Brewster as curator of the latter's large collection of birds. Brewster's "October Farm" along the Concord River lay in the midst of a region of unusual botanical interest, which Deane exploited whenever he was invited to Concord. During nearly fifty years of botanical activity, he had built up a private herbarium of forty thousand sheets by personal collecting, purchase, and exchange, many of them annotated by specialists. As one of the twelve charter members of the New England Botanical Club he was influential in putting it and its journal *Rhodora* on a firm foundation. His close association with the Gray Herbarium and its successive curators, and with the other botanical establishments at Harvard, not to mention his outgoing, genial nature, was well-nigh crucial in establishing that symbiotic relationship between amateur and professional, Club and University, which has continued ever since. Only thirty-eight of Deane's specimens are cited in the Catalog. This meager number is explained by the fact that his will provided for the division of his herbarium between Harvard and the Club. Several years elapsed before it could be processed for insertion in the organized collections. In the meantime, the private herbaria of a number of other persons who had collected extensively in eastern Massachusetts were received. Inevitably, there were specimens from

Concord which pre-empted spaces that otherwise would have been filled by Deane's beautifully prepared sheets. Furthermore, vouchers for the woody flora of the Concord Town Forest had already been accepted by the Club, as well as a numerous suite from the Goose Pond-Walden region. Thus, most of Deane's collections from Concord were redundant and were distributed to other institutions. Even so, he well merits inclusion in this brief survey. His infectious enthusiasm and familiarity with the town stimulated a number of his friends, whose names appear on Concord labels, to explore and collect there.

Alfred W. Hosmer (1851-1903) was a store keeper on the Milldam in Concord; he seems to have relied heavily on a clerk to deal with his customers while he, a frugal bachelor, followed in the footsteps of Thoreau, Hoar and Pratt, as well as blazing many a new trail himself. He collected assiduously, built up a large local herbarium, and otherwise busied himself by keeping an eye on Pratt's introductions and gathering together an invaluable collection of Thoreauviana before most people prized such relics.

Somewhat of a lone wolf, he was uninstructed in the techniques of plant collecting, rarely preserving such important diagnostic features as roots, rhizomes, and basal leaves of herbs. Except for noting township of origin, detailed data such as habitat, locality, and date were generally omitted. He maintained a check-list of his collections, and for a decade recorded the dates of the onset of flowering of many species year by year. According to his records, now preserved in the Library (31), he collected a number of plants previously of unknown occurrence in Concord and not seen since. After remaining neglected in family attics for over forty years, his herbarium was presented to the New England Botanical Club. It proved to have been so badly damaged that only seventy-two Concord specimens were worth salvaging. In the first volume of *Rhodora* (1899) are three short articles by Hosmer, two concerned with Concord subjects: "Plants Introduced by Minot Pratt" and "Further additions to the Flora of Middlesex County." Despite his go-it-alone tendencies, he was often accompanied by one or more youngsters on his walks about town, thus interesting them in plant identification and showing them the whereabouts of rarities. Alfred Hosmer died in middle age, much beloved by his fellow townsmen. He

probably had a more detailed knowledge of the flora of Concord than anybody else.

Emile Francis Williams (1858–1929) of Boston and Cambridge was yet another amateur who collected in Concord. His interest in botany was aroused in his mid-thirties by a chance encounter with Dr. G. G. Kennedy, who had been a pupil of Asa Gray, and soon developed into a major avocation. Through Kennedy, he met the botanists at the Gray Herbarium, as well as Edwin and Charles Faxon, Walter Deane, and other competent amateurs. Although still a confessed novice in 1896, Williams was one of the prime movers in the founding of the New England Botanical Club and served as its first Recording Secretary and Treasurer for twenty-five years. In 1904, he married Blanche E. Wheeler, daughter of George F. and Alice R. Wheeler of Concord. As a frequent visitor to the town, he did some casual but discriminating collecting there. In 1916, he gave his large herbarium to the Gray Herbarium, which in turn allowed the Club to select needed specimens from New England. Among them are thirty-two from Concord representing twenty-eight species, and four named varieties and forms hitherto unrepresented in the Club's holdings and therefore cited in the Catalog. To be sure, they constitute a less than modest addition to our documented knowledge of the flora of the town. Like Walter Deane, however, Emile Williams is a figure of botanical importance to Concord, because of his influence in establishing and perpetuating the New England Botanical Club where interest in local floristics was stimulated and perpetuated among his contemporaries and younger men, down to the present day.

Among the sixty-eight persons listed whose names appear on the labels of Concord specimens there are a few others, now dead, who should be mentioned as having been cited in the Catalog four or more times:

Thomas Morong (1827–1894),

a noted student of the genus *Potamogeton*: four times.

Charles W. Swan (1838–1921) :

eight times.

Frank S. Collins (1848–1920),

co-author of the Flora of Middlesex County, Massachusetts :
four times.

Charles W. Jenks (1848–1929),

an active amateur of the neighboring town of Bedford:
seven times.

William Brewster (1851–1919),
noted ornithologist of Cambridge and October Farm, Concord;
a founder of Nuttall Ornithological Club; first president
of Massachusetts Audubon Society: six times.

Charles E. Perkins (1851–1883) :
eight times.

Roscoe Frohock (n.d.) :
five times.

Mary C. Rodman (1854–1919),
of Concord: four times.

Arthur B. Seymour (1854–1933) :
four times.

LIST OF COLLECTORS CITED IN THE CATALOG

- Anderson, Esther Howe (1891–)
Bailey, Liberty Hyde, Jr. (1858–1954)
Barrett, Emiline E. (1811–1892)
Bartlett, Martha (1824–1890)
Batchelder, Charles Foster (1856–1954)
Boott, William (1805–1887)
Brainerd, John Whiting (1918–)
Brewster, William (1851–1919)
Buttrick, George (1845–1897)
Cheever, Dr. Austin Walter (1887–)
Churchill, Joseph Richmond (1845–1933)
Collins, Frank Shipley (1848–1920)
Cummin, Dr. J. W.
Countryman, William Douglas (1920–)
Cummings, M.
Dame, Dr. Lorin Low (1838–1903)
Davenport, George Edward (1833–1907)
Deane, Walter (1848–1930)
Eaton, Richard Jefferson (1890–)
Faxon, Edwin (1823–1898)
Fernald, Merritt Lyndon (1873–1950)
Field, C. C.
Frohock, Rev. Roscoe
Greenman, Jesse More (1867–1951)
Griscom, Ludlow (1890–1959)

- Hellquist, Carl Barre (1940—)
Heyliger, Frederick Theodore (1916—)
Hicks, Alice Mayo
Hoar, Edward Sherman (1823–1893)
Hosmer, Alfred Winslow (1851–1903)
Hoyle, Alexander Edward (1881–1969)
Hunnewell, Francis Welles (1880–1964)
Hunnewell, James Melville (1876–1954)
Jarvis, Dr. Charles (1800–1826)
Jarvis, Dr. Edward (1803–1889)
Jenks, Charles Wilham (1848–1929)
Joyce, Benjamin Robbins (1822–1899)
Kennedy, Dr. George Golding (1841–1918)
Logermann, Elma Pentilla (1918—)
Lund, James
Mann, George Combe (1845–1921)
Mann, Horace, Jr. (1844–1868)
Manning, Warren Henry (1860–1938)
McClintock, Mary (1921—)
Morong, Rev. Thomas (1827–1894)
Parsons, Miss (cited by D. C. Eaton as having collected *Lygodium palmatum*, Climbing Fern, in Concord in 1855)
Perkins, Charles E. (1851–1883)
Pratt, Caroline Hayden (1836–1866)
Pratt, Minot (1805–1878)
Procter, George Richardson (1920—)
Purdie, Henry Augustus (1840–1911)
Rich, William Penn (1849–1930)
Richardson, Anne Weed (1899—)
Richardson, Horatio Stillman (1846–1922)
Richardson, Laurence Eaton (1893—)
Rodman, Mary C. (1854–1919)
Seymour, Arthur Bliss (1859–1933)
St. John, Harold (1892—)
Svenson, Henry Knute (1897—)
Swan, Dr. Charles Walter (1838–1921)
Teele, Katharine Hughes (1903—)
Thoreau, Henry David (1817–1862)
Thoreau, Sophia E. (1819–1876)
Weatherby, Charles Alfred (1875–1949)
Weir, Elizabeth Jordan (1830–1914)

Wheeler, Ruth Robinson (1890–1973)
Williams, Emile Francis (1858–1929)
Wood, Carroll Emory, Jr. (1921–)

ENDANGERED NATIVE SPECIES

Although a quarter of the area of the town is currently (1974) withdrawn from private use, all plants designated in the Catalog as rare are exposed to the danger of extermination through natural causes or by destruction of habitat or subtle ecological imbalances inevitable in a growing community. Among them are listed a few species which appear to be particularly vulnerable (see page 53 for orthography and abbreviations) :—

Lycopodium inundatum vars. **Biglovii** and **robustum**. Increased competition from encroaching vegetation threatens survival in the Ministerial Swamp (Harrington's Bog).

Uvularia perfoliata, Perfoliate Wild-oats. Encroaching housing development and road construction on Annursnack Hill a real danger.

Iris prismatica. Formerly occasional in the acid peaty margins of river meadows and two brooks; now becoming rare owing to pollution (?) and destruction of undisturbed habitat.

Calopogon pulchellus, Grass Pink. Progressive elimination of undisturbed habitat has reduced this formerly scarce orchid to the status of a local rarity.

Arethusa bulbosa. Formerly abundant in several sphagnous bogs and swampy places; now an occasional plant may be found along a single brook meadow. Thoreau mentions it at Hubbard's Close and other localities where long since extirpated. Pratt recorded it as "abundant in mossy [i.e., sphagnous] swamps all over town." The rapid waning of *Arethusa* throughout eastern Massachusetts may be due to thoughtless picking as well as destruction of habitat.

Liparis liliifolia. Known in Middl. by a collection by T. Morong, 1878, in Ashland; in Concord, where three closely clustered plants were discovered by Mr. W. Y. Walworth on his property in Conantum in 1959, in a pocket of rich soil on a steep wooded slope, one plant still surviving (1974) despite danger of wash-out by spring melts and heavy rains; and in Lexington, where a single plant was discovered in 1970 on property of Rolla M. Tryon.

Celtis occidentalis var. **pumila**, Hackberry. Only two individuals

have been found in recent years: one a mature tree at foot of Nashawtuc Hill and the other, a sapling on Annursnack Hill. See comment on p. 107 of the Catalog.

Ranunculus fascicularis, Early Crowfoot. Increasing scarcity noticed in a recreational area, despite precautions of interested owners.

Hepatica americana, Liverwort. When last visited, a small colony in the Ministerial Woodlot much reduced by earlier woodland fires. Only about eight plants found.

Cassia fasciculata, Partridge Pea. This and the next species occur near the foot of Punkatasset Hill and across the river near the filter bed. Both are subject to danger from encroaching woods and old-field vegetation.

Crotalaria sagittalis, Rattlebox

Lupinus perennis, Wild Lupine. The continued persistence of two or three plants on gravelly roadside bank on the Old Road to Nine Acre Corner may have already been terminated by road improvements.

Hibiscus palustris, Marsh- or Rose-Mallow. Two plants were found in 1959 and still persist (1974).

Asclepias tuberosa, Butterfly-weed. Known to occur as single plants in two localities near the river under Punkatasset Hill, each threatened by encroaching woods and thickets. Reproduction in neighboring open fields and roadsides remains undetected.

Cuscuta Polygonorum, Dodder. When first discovered, this parasitic twiner on *Polygonum* along the shore of Goose Pond was unrecorded elsewhere in New England. It is still regionally rare. Proposed state highway construction will obliterate it.

Eupatorium pilosum, Thoroughwort. Vulnerable to manicuring near Lee's Bridge along a private driveway.

Bidens comosa, Beggar's-ticks. Known in Concord only from shore of Goose Pond where threatened by proposed road construction.

RARE SPECIES, PRESENT STATUS UNKNOWN

The following incomplete list comprises indigenous plants designated in the Catalog as rare in Middl. or larger provinces in Massachusetts, but which have not been found in Concord for many years.

Ophioglossum vulgatum var. **pseudopodium**, Adder's Tongue
Lygodium palmatum, Climbing Fern. Probably destroyed many years ago by the dumping of rubbish between a wood road and the sphagnum bog at the southwest extension of the Ministerial Swamp (5), more recently referred to as Harrington's Bog. Apparently it was last observed by Wilfred Wheeler about 1920 when he was gathering a cart-load of sphagnum moss for his greenhouse. (Verbal report to the author.)

Woodia ilvensis, Rusty Woodsia

Dryopteris disjuncta, Oak Fern

D. Phegopteris, Long Beech Fern

D. hexagonoptera, Broad Beech Fern

D. spinulosa var. **concordiana**, Purdie's Fern. A single plant discovered by H. A. Purdie and Wm. Brewster in 1902. Doubtless a mutant. See Rh. 6: 31-33 (1904).

Poa angustifolia

Muhlenbergia glomerata var. **cinnoides**. Record based on a Thoreau collection from "Swamp below Hoar's pond," i.e., Fairyland Pond in the Concord Town Forest.

Panicum virgatum

P. latifolium

Scleria triglomerata. Known only from a collection by E. S. Hoar found in "Wet meadow w. of Lee farm. Road to Concord. Edge of woods."

Carex disperma. Recorded in Middl. only from Concord: two stations.

C. interior

C. prairea. One of Hoar's collections from the meadow under Clam Shell Bluff. (See pp. 13 and 83.) Chiefly a sedge of calcareous soils.

C. oligosperma. The swamp where this plant was found is suspected to be one which was subsequently flooded.

Trillium undulatum, Painted Trillium

Habenaria dilatata. Two other records from eastern Massachusetts: Sudbury (Middl.), Sandwich (Barnstable).

H. orbiculata

Liparis Loeselii

Cerastium nutans

Adlumia fungosa, Climbing Fumitory

Potentilla fruticosa, Shrubby Cinquefoil. Found in the same small bog as *Carex prairea*.

Rubus odoratus, Flowering Raspberry
Prunus maritimus, Beach Plum
Oxalis montana
O. violacea
Geranium Robertianum, Herb-Robert. Records of indigenous occurrence not to be confused by occasional weedy escape from cultivation.
Xanthoxylum americanum
Elatine minima
Osmorhiza longistylis
Angelica atropurpurea
Leucothoë racemosa
Gaylussacia dumosa
Pycnanthemum clinopodioides
Phryma Leptostachya
Linnaea borealis, Twinflower. A tiny colony in the Ministerial Woodlot was destroyed about 1930 by the last of three forest fires. However, two other stations reported by Thoreau have not been re-discovered and may still exist.
Eupatorium fistulosum
E. pubescens
Solidago flexicaulis
Aster infirmus
Cirsium pumilum

EXTIRPATED SPECIES

The following plants have not recently been found where they formerly occurred and are considered to grow no longer in Concord.

Lygodium palmatum, Climbing Fern. It is suspected to have been destroyed by rubbish disposal.

Chamaecyparis thyoides, White Cedar. Gradually eliminated as an indigenous species by cutting for fence posts, etc., the last three or four trees sometime after 1920.

Pinus resinosa, Red Pine. Two small indigenous groves, one eliminated by unknown cause, the other undermined by gravel removal.

Cladium mariscoides, Twig-rush. A single large colony at Grassy Pond was destroyed by a housing development.

Habenaria blephariglottis, White Fringed Orchis. Destroyed by drainage operations.

Liparis Loeselii, Bog or Yellow Twayblade. Not reported since its original collection about 140 years ago in a habitat still undisturbed.

Arceuthobium pusillum, Dwarf Mistletoe. Habitat destroyed by drainage operations and host tree cut down.

Cassia hebecarpa, Wild Senna. Last seen about 1905; probably destroyed by highway improvements.

Asclepias verticillata, Whorled Milkweed. The last plant to be found disappeared about eight years ago.

Ledum groenlandicum, Labrador Tea. A thriving colony gradually eradicated by drainage operations and brush cutting.

Castilleja coccinea, Painted Cup. A large colony well known to Hosmer and his predecessors has unaccountably disappeared.

Solidago speciosa, Goldenrod. Station destroyed by soil removal.

SPECIES DOUBTFULLY DETERMINED (INCLUDED IN CATALOG)

Carex novae-angliae Schwein.

C. Haydenii × **nigra**

Betula papyrifera Marsh. var. **cordifolia** Marsh.

Polygonum cristatum Engel. & Gray.

H. decapetalus L.

CENTAUREA NIGRA L. var. **NIGRA**

HIERACIUM PILOSELLA L. and **H. FLAGELLARE** Willd. The distinction between these species is sometimes difficult to draw.

SPECIES AND LESSER TAXA RELIABLY REPORTED BUT NOT REPRESENTED BY KNOWN SPECIMENS

Lycopodium inundatum L. var. **Biglovii** Tuckerm. See Rh. 33: 202.

THUYA OCCIDENTALIS L. Occasionally spontaneous as an escape from cultivation.

Smilacina trifolia (L.) Desf. Pratt (15) wrote: "Some specimens of this, gathered from the wet meadow opposite Waldo Flint's, but I have never found it myself."

Cypripedium acaule Ait. forma **albiflorum** Rand & Redfield. Occasional.

ANEMONE CANADENSIS L. Reported as "*A. Pennsylvanica* L., dry open roadside in north part of Concord," by Hosmer in Rh. 1: 223. Probably an escape from cultivation.

ROSA CANINA L., Dog-Rose. Reported by Hosmer as "persistent at three stations for twenty-five years" in Rh. 1: 223. To be distinguished from *R. Eglanteria* and *R. micranthus* by their leaves, glandless on both faces and teething glabrous, not aromatic.

EUPHORBIA COROLLATA L. Casually adventive from farther south. Brewster & Purdie in Rh. 3: 253 (1901).

Vitis labrusca L. forma *alba* (Prince) Fern. Rare form with ripe fruits light pink to whitish. Open woods near Goose Pond. Station destroyed.

MALVA SYLVESTRIS L. Reported from Concord by Hosmer in Rh. 1: 223.

Viola conspersa Reichenb. forma *Masonii* (Farw.) House. Specimen lost; collected by R. J. Eaton from bank of springhead northwest of Nashawtuc Hill, where it persisted for many years.

Gaylussacia baccata (Wang.) K. Koch forma *glaucocarpa* (Robins.) Mackenz. Rather common.

Asclepias quadrifolia Jacq. Dry, often rocky woods. Thoreau twice mentions its occurrence at Conantum, but no specimen has been found. However, there is no good reason to suppose that he was in error, as the species is easily recognized in the field and the habitat is favorable. Th. J. 4: 138; 5: 289.

Utricularia resupinata B. D. Greene. Reported from "ponds in Concord, Acton, and Lincoln" in Rh. 1: 224.

EXCLUDED SPECIES

Cystopteris bulbifera (L.) Bernh. A. W. Hosmer (NEBC). Doubtless introduced by Pratt. A calcicolous species not known in Massachusetts east of Franklin Co. See Rh. 1: 171 (1899.)

Dryopteris Goldiana (Hook.) Gray. A. W. Hosmer (NEBC). Very rare in eastern Massachusetts. Probably introduced by Pratt.

Athyrium pycnocarpon (Spreng.) Tidestr. A. W. Hosmer (NEBC). Species not otherwise known in Massachusetts east of Franklin Co. Doubtless introduced by Pratt. Listed by Seymour (36) as from Concord.

CAMPTOSORUS RHIZOPHYLLUS (L.) Link, Walking Fern. Hosmer, n.d.; Eaton, 1956 (NEBC). Introduced by Minot Pratt

about 1860 on wall of lime quarry in Estabrook Woods. Scarce but thriving in 1956; a well-developed specimen found by M. Cohen and collected for herbarium of Concord Field Station.

Sphenopholis obtusata (Michx.) Scribn. Attributed to Concord (as *Eatonia obtusata*) by Dame & Collins (33) as in herbarium of E. S. Hoar. Specimen not found.

S. intermedia Rydb., (*S. pallens* (Spreng.) Scribn.). A Thoreau specimen dated 11 July 1860: "James Baker's . . . mud-hole behind his house." Attributed to Concord on NEBC annotation label, but station in Lincoln according to Gleason (5).

Muhlenbergia glomerata (Willd.) Trin. Reported in Dame & Collins (33) by E. S. Hoar, but no specimen found.

Eleocharis palustris (L.) R. & S. var. **major** Sonder. An old-world species, according to H. K. Svenson, which does not occur in North America, and confused with our very common *E. Smallii* Britt. See Rh. 44: 62 (1942).

Scirpus verecundus Fern., (*S. planifolius* Muhl.). A Thoreau specimen dated 11 May 1859. Annotated on NEBC label as from Concord, but the locality cited by Thoreau as along the base of Smith's Hill (5), which apparently is in Lincoln near the Concord line.

Carex aquatilis Wahlenb. Its reported occurrence in Concord is based on: (1) a fragmentary specimen, collected by E. S. Hoar and mounted subsequently over two confusing labels with slips of paper in Hoar's handwriting, one dated "8 June" and the other reading "*Carex aquatilis* Wahl., Identified by Prof. Bailey, Conantum near sessile-leaved ash. Concord June 11th." This latter slip probably refers to a missing specimen which Fernald saw and annotated as *C. aquatilis* before sending it to the mounting room. Hence, the June 8th slip refers to the fragment, which appears to be *C. stricta* Lam. Fernald's annotation, erroneously pasted on the sheet bearing the two misleading slips, should be ignored. A Concord record also appears in Flora of Middlesex Co. (33), based on "specimen in Thoreau Herb. fide Walter Deane" which has not been found.

Erythronium americanum Ker. Record based on a specimen labelled "Concord" with no other data. No well-documented collection from Concord is known.

Smilacina stellata (L.) Desf. Ex Herb. A. W. Hosmer, bearing a slip reading "Concord" with no other data. Being rare in Middl. except near the coast, and not otherwise recorded from Concord, it seems best to assume that it was cultivated or an unrecorded Pratt introduction.

Trillium grandiflorum (Michx.) Salib. Ex Herb. A. W. Hosmer, no data other than Concord, and doubtless an introduction.

Habenaria hyperborea (L.) R. Br. var. **Huronensis** (Nutt.) Farw. In herbarium of Sophia E. Thoreau, but lacks collecting data. Although this plant is unrecorded from Concord, Miss Thoreau well may have found it there, sharp-eyed as she was.

Carya laciniosa (Michx.) Loud. Record in Fl. N. E. based on a presumed introduction. Specimen has been removed from NEBC. It was collected by R. J. Eaton from an old tree on the northwest boundary of the R. W. Emerson house and possibly was introduced by Emerson himself.

Cerastium arvense L. Dame & Collins (33) attribute its presence in Concord to a report of H. S. Richardson. No specimen has been found to support the record.

Thalictrum revolutum DC. A staminate specimen mounted on a sheet with scrappy specimens from Medford and Woburn is labelled "Concord or vic. June 17, 1880, ex Herb. C. E. Perkins." The collector, whether Perkins or somebody else, was too vague about the locality for an acceptance of the record.

Dentaria diphylla Michx. The Concord record is based on a collection by E. F. Williams in 1898 and annotated "Introd. on Minot Pratt place." It was probably found in a large wild garden near the Pratt house where a number of introduced plants of rich soil flourished until it was made over into a lawn. Thoreau's specimen is annotated "Brattleboro — Mrs. Brown."

Tiarella cordifolia L. Hosmer's specimen (n.c.d.) unquestionably exotic, either from cultivation or from plants originally introduced by Minot Pratt. See Rh. 1: 171.

Mitella diphylla L. Hosmer's specimen (n.c.d.) in same category as *Tiarella* above.

Rubus flagellaris Willd. Hoar's specimen of 1858 was misidentified (fide Hodgdon and Steele).

Impatiens pallida Nutt. The specimen attributed to Concord by

A. W. Hosmer lacks collection data. Being unknown as an indigenous species east of Franklin Co. in Massachusetts it seems best to consider it an introduction.

Lechea minor L. Another Hosmer specimen from Concord lacking collection data. Being otherwise known in Massachusetts from Bristol and Barnstable counties, it seems proper to exclude this record.

Viola rostrata Pursh. Without further evidence that this species is indigenous in Concord or persisting as a recorded introduction, Mary Rodman's specimen (May, 1899) is regarded as garden grown.

Hottonia inflata Ell. Eaton's collection on 2 July 1960 was a portion of a two-year old plant appearing spontaneously in a sphagnum-bog garden in close proximity to leach-lines from a septic tank. Probably it was inadvertently introduced as a seed or seedling. The plant did not reproduce and is therefore considered a transient waif.

Ipomoea hirsutula Jaq. f. E. S. Hoar's specimen of 20 August 1858 was annotated by him: "Garden. Nat." from which it is inferred that it was a spontaneous occurrence in his garden. There is no evidence of its having persisted without cultivation. As did Fernald in the Man., the record is here ignored also.

Gerardia tenuifolia Vahl var. **parviflora** Nutt. The citation in Fl. N. E. (p. 487) of a specimen in NEBC collected by R. J. Eaton on 17 August 1951, was based on a misidentification of *G. paupercula* (Gray) Britt.

Opuntia humifusa Raf. A surviving introduction, undoubtedly by Minot Pratt.

Lonicera Xylosteum L., Fly Honeysuckle. Reported from Concord in Fl. N. E. (p. 504), but no specimen cited or found.

Viburnum alnifolium Marsh. was collected by A. E. Hoyle (fide A. S. Pease) in May 1901, in "Concord or vicinity." It is a rare shrub in Middl. east of Townsend and has never definitely been reported from Concord.

Lobelia Kalmii L. The only specimen in NEBC from Massachusetts east of Franklin Co. is labelled by E. S. Hoar as from "Concord July 8th '57 or Hopkinton Springs July 11-14, '57," i.e., 1857. Since there is no suitable habitat for this species in Concord, it must be assumed that Hopkinton Springs is the more likely locality.

Eupatorium rugosum Houtt. The only record is a Hosmer specimen annotated "Concord." It is suspect because he cites the plant as introduced by Minot Pratt. See Rh. 1: 170.

Gnaphalium Macounii Greene. Specimen in Thor. Herb. under synonym *G. decurrens* Ives is too immature to identify with certainty.

CACALIA SUAVEOLENS L. Specimen in Thor. Herb. lacks collection data, hence origin is uncertain.

ARCTIUM LAPPA L., Great Burdock. Although probably collected in Concord, specimen in Thor. Herb. lacks collection data, hence origin uncertain. Naturalized from Europe.

SONCHUS OLERACEUS L. Specimen in Thor. Herb. lacks collection data and likewise of uncertain origin. Naturalized from Europe.

LACTUCA HIRSUTA Muhl. var. **SANGUINEA** (Bigel.) Fern. Specimen in Thor. Herb. annotated *L. canadensis* L. var. *sanguinea* Torr. & Gray without collection data. Its origin doubtfully Concord, hence excluded from Catalog.

HIERACIUM PILOSELLA L. var. **NIVEUM** Muell. Citation in Fl. N. E. as from Concord based on a collection by Eaton in 1957, who now considers it a form of *H. flagellare*; specimen filed in NEBC under this latter species.

COMPARATIVE STATISTICAL SUMMARY

	Concord*	Fl. of N. E. (Seymour)	Gray's Man. 8th Ed. (Fernald)
Families	120	151	168
Genera	464	790	1133
Species:			
Indigenous	866	2005	4425
Introduced	285	877	1098
Total	1151	2882	5523
Additional varieties:			
Indigenous	84	576	1487
Introduced	17	84	125
Total	101	660	1612
Additional named forms and hybrids:			
Indigenous	55	443	1121
Introduced	6	48	84
Total	61	491	1205
Species and additional varieties known from "Middlesex" but not from Concord	419		
<i>Carex</i> , largest genus			
Species	72	186	267

*Includes five species and one lesser taxon reliably reported but not represented by known specimens.

ANNOTATED CATALOG

The reference work on which this catalog is based is Gray's Manual of Botany, 8th Edition (Fernald, 1950). A few of the nomenclatural changes convincingly proposed since its publication are indicated in parentheses, or otherwise briefly discussed. The student is referred particularly to its Table of Contents, page *xiii*, for page references to analytical key to the families, abbreviated names of authors, other abbreviations and signs, glossary, and indexes to Latin and colloquial names.

Numeration. The numbering of all the taxa in the Manual is retained to facilitate rapid reference to it and to the insertion of subsequent additions to the flora of Concord.

Keys. An analytical key to the families may be found on page *xxxii* of the Manual. For the beginner the easier key in Britton and Brown's New Illustrated Flora (Gleason, 1952) is recommended. Page references to the Manual are given for keys to the genera within the families and to the species within most of the genera at their appropriate places.

Citations of Specimens. In general, only one specimen in a given entry is cited, and that one usually is the earliest collection to be found in the herbarium of the New England Botanical Club. Many of these are seventy-five to over one hundred years old, identifiable but often scrappy or incomplete. Occasionally citations of modern specimens are added. All citations are indicated in parentheses, *e.g.*, (Thoreau, 1859.). The Club herbarium is so organized that an accredited student, with preliminary help from the Club curator, may find rapidly any desired specimen. In a few instances a cited specimen is located in the Gray Herbarium or the herbarium of the University of Massachusetts and is so indicated. Specimens in the Thoreau Herbarium (see Introduction, p. 31) which lack collecting data but which are presumed to have been collected in Concord are indicated by the symbol [Thor.]. Catalog entries based solely on such unauthenticated Concord specimens are enclosed by brackets: [].

Status. The status of plants in Concord and the Middlesex Area follows the citations of specimens, the latter in parentheses if there is a significant difference. Whether a plant is considered common, frequent, uncommon and so on is a matter

of judgment, often an educated guess, but one based on extensive field work. In a rapidly growing community, changes in habitat may alter the present status of plants or even exterminate them. *Arethusa* is a case in point. Minot Pratt considered it common one hundred years ago. At the turn of the century, it was abundant in a bog (now an artificial pond) but otherwise scarce in several other locations. Sixty years later I was able to find a few plants only, along the upper reaches of a single brook meadow, but it may not have survived the desiccation of its habitat resulting from the long drought of the early 1960's and subsequent lowering of the water table by driven wells. The connotation of the terms "common," "frequent," "uncommon" and so forth differs in respect to status in the Middlesex Area. The latter is indicated in parentheses if different from that of Concord and is often a rather arbitrary guess, based on the number of townships represented by specimens in NEBC. For example, Black Snakeroot (*Sanicula marylandica*) is designated as uncommon in Concord and frequent in Middlesex County, being known from, say, ten towns in the area. For aught I know, it may be rare in each of the ten towns.

ABBREVIATIONS AND SYMBOLS

NATIVE SPECIES are indicated by bold face type.

INTRODUCED, ADVENTIVE, or EXOTIC SPECIES are indicated by small capitals.

COMMON or ENGLISH names are designated by regular type and follow the Latin species name.

ABBREVIATIONS (excepting those of names of authors, which are listed in Gray's Manual on pages *liii-lviii*) :

Fl. Vt. — The Flora of Vermont, 1st Ed., F. C. Seymour, Burlington, Vermont, 1969.

Fl. N. E. — The Flora of New England, 1st Ed., F. C. Seymour, Rutland, Vermont, 1969.

GH — Gray Herbarium, Harvard University.

Man. — Gray's Manual of Botany, 8th Ed., M. L. Fernald, American Book Company.

Middl. — Middlesex Area, here defined as Middlesex County, Massachusetts, excluding the northwestern towns of Ashby, Dunstable, Pepperell, Townsend, and the brackish waters and adjacent salt marshes fringing the county in the east.

NEBC — New England Botanical Club, herbarium of (presently housed at 22 Divinity Avenue, Cambridge, Massachusetts).

n.c.d. — No collecting data.

n.d. — No date; not dated.

Rh. — Rhodora: Journal of the New England Botanical Club.
ssp. — species (plural).

Th. J. — Thoreau's Journal, 14 volumes, Houghton Mifflin Co., 1906.

Thor. Herb. — Thoreau Herbarium (see Introduction, page 31 et seq.).

U. Mass. — University of Massachusetts, herbarium of, Amherst.

var. — *varietas*, variety.

DIVISION I. PTERIDOPHYTA (VASCULAR CRYPTOGAMS)

Family 1. EQUISETACEAE (HORSETAIL FAMILY)

1. EQUISETUM L. Horsetail

Key: Man. p.3

1. **E. arvense** L.—Dry or moist, open or shady habitats. (Hoar, 1858.) Common, often weedy. [Thor.]
4. **E. sylvaticum** L. var. **pauciramosum** Milde forma **pauciramosum**, Woodland Horsetail.—Woods, thickets, and openings. (Eaton, 1957.) Infrequent. (Frequent.)
— forma **multiramosum** Fern.—Similar habitats. (Eaton, 1932.) Not common. Differs from the simply to only slightly forking branches of the preceding form by its copiously forking and reforking ones. [Thor.]
7. **E. fluviatile** L., Water Horsetail, Pipes.—River margins, shallow water. (Hosmer, n.d.) Rh. 23: 45. Frequent. [Thor.]
9. **E. hyemale** L. var. **affine** (Engelm.) A.A. Eat., Scouring Rush.—Dry or moist sandy woods, openings, etc. Forms large, dense, evergreen colonies, e.g., beside Sandy Pond Road near Lincoln line. (Eaton, 1956.) Not common. [Thor.] In addition to forma *affine*, two other forms of this variety have been described: forma *pumilum* and forma *polystachyum*. [Thor.]

Family 2. LYCOPODIACEAE (CLUB MOSS FAMILY)

1. LYCOPODIUM L. Club Moss

Key: Man. p.10

3. **L. lucidulum** Michx., Shining Club Moss.—Cool, moist, often wet woods. (Eaton, 1922.) Frequent, locally abundant. [Thor.]
6. **L. inundatum** L., Bog Club Moss.—Damp, sandy, or peaty open places. (Eaton, 1922.) Infrequent, often transient.
— var. **robustum** R.J. Eat. (Eaton, 1931, type specimen.) Rh. 33: 202. Rare.
8. **L. clavatum** L., Staghorn Club Moss, Ground Pine.—Cool, dry, mostly evergreen woods. (Eaton, 1921.) Occasional.
— var. **megastachyon** Fern. & Bissell. (Hoar, 1858.) Rh. 12: 50. Rare. [Thor.]
9. **L. obscurum** L. var. **obscurum**, Ground Pine.—Dry or

moist woods. (Hoar, 1857.) Common, often abundant.
[Thor.]

— var. **dendroideum** (Michx.) D.C. Eat.— Similar
habitats. (Eaton, 1957.) Common. [Thor.]

12. *L. complanatum* L. var. *flabelliforme* Fern.— Similar habi-
tats. (Hoar, 1857.) Common. [Thor.]
13. *L. tristachyum* Pursh.— Dry sandy woods, old pastures.
(Swan, 1890.) Common.

Family 3. SELAGINELLACEAE (SPIKEMOSS FAMILY)

1. SELAGINELLA Beauv. Spikemoss

Key: Man. p.16

2. *S. apoda* (L.) Fern.— Moist sands and peats. (Hoar,
1879.) Occasional. [Thor.]
3. *S. rupestris* (L.) Spring.— Exposed flat ledge; thin
starved soils. Rare. (Occasional.) Presumably collected
by Thoreau in Concord: see Th. J. 7: 519 where he
refers to "that little grayish-green and rigid moss-like
plant on top of Lee's Cliff." [Thor.]

Family 4. ISOËTACEAE (QUILLWORT FAMILY)

1. ISOËTES L. Quillwort

Key: Man. p.17

4. *I. muricata* Dur.— Rooted on sandy pond margins in
shallow water. (Eaton, 1957.) Uncommon. The com-
monest species in Middl. where generally distributed,
but not frequent.
7. *I. riparia* Engelm.— Submerged in shallow water along
sandy pond shores. (Eaton, 1957.) Rare.
8. *I. macrospora* Dur.— Submerged in deeper water than
preceding species. (Proctor, 1949; Eaton, 1957, both
from Walden Pond.) Rare.

Family 5. OPHIOGLOSSACEAE (ADDER'S-TONGUE FAMILY)

1. BOTRYCHIUM Sw. Grape-Fern

Key: Man. p.20

2. *B. dissectum* Spreng. forma **dissectum**.— Woods. (Wil-
liams, 1897.) Uncommon. [Thor.]
— forma **obliquum** (Muhl.) Fern.— Woods. (Hoar,
1874.) Uncommon. [Thor.]
— forma **oneidense** Clute.— Woods. (Davenport,
1874.) Rare.

5. **B. matricariaefolium** A. Br. — Moist woods. (Eaton, 1932.) Scarce.
7. **B. virginianum** (L.) Sw., Rattlesnake-fern. — Woods, usually in rich leaf mold. (Eaton, 1932.) Scarce. [Thor.]

2. **OPHIOGLOSSUM** L. Adder's-tongue

Key: Man. p.23

1. **O. vulgatum** L. var. **pseudopodium** (Blake) Farw. — Wet acid turfs, swales, sands, etc. (Manning, 17 June.) Reported in the Pratt MS, 1872, with the comment "Eureka." Very rare. (Local; a single other collection from Middl.)

Family 6. **OSMUNDACEAE** (FLOWERING FERN FAMILY)

1. **OSMUNDA** L. Flowering Fern

Key: Man. p.24

1. **O. regalis** L. var. **spectabilis** (Willd.) Gray, Royal Fern. — Low woods, peaty thickets and swampy meadows, etc. (Hoar, 1857.) Common. [Thor.]
2. **O. Claytoniana** L., Interrupted Fern. — Thickets, roadsides, moist woods. Tolerates drier soil than next species. (Eaton, 1957.) Common. [Thor.]
3. **O. cinnamomea** L., Cinnamon Fern. — Low woods and thickets, swamps. (Deane, 1886.) Abundant. [Thor.]

Family 7. **SCHIZAEACEAE** (CURLY-GRASS FAMILY)

2. **LYGODIUM** Sw. Climbing Fern

1. **L. palmatum** (Bernh.) Sw. — Moist, peaty, or acid soils of thickets, open woods. (Thoreau, 1851; Miss Parsons, 1855. Ex Herb. D.C. Eaton, Aug. 1855.) Rare. There is a specimen in Thoreau's herbarium which I accept as his collection presumably on 24 November 1851, the day he recorded in the Journal its discovery on the south side of Ministerial Swamp. Station probably destroyed; repeated search in recent years has been fruitless.

Family 9. **POLYPODIACEAE** (FERN FAMILY)

1. **WOODSIA** R. Br. Woodsia

Key: Man. p.27

1. **W. ilvensis** R. Br., Rusty Woodsia. — Dry, mostly sterile rocks, cliffs. (Thoreau, 1851; Miss Parsons, 1855.) Not seen in recent years. Rare. (Uncommon.) [Thor.]

8. **W. obtusa** (Spreng.) Torr. — Dry wooded slopes, rocky woods and ledges. (Thoreau, 1859; Batchelder, 1885; Eaton, 1921.) Rare. (Uncommon.) [Thor.]

2. CYSTOPTERIS Bernh. Bladder Fern.

Key: Man. p.29

1. **C. fragilis** Bern. var. **Mackayii** Lawson. — Damp cliff crevices, rock walls, damp rocky open woods. (H. Mann, Jr., ca. 1862; Eaton, 1965.) Scarce.
— **forma dentata** (Dickson) Clute. — Wet cliffs, rock walls, and crevices. (Hosmer, n.c.d.) A single collection. Rare.

3. PTERETIS Raf. Ostrich-Fern

1. **P. pensylvanica** (Willd.) Fern., (*Matteuccia pensylvanica* (Willd.) Raymond). — Rich or bottom-land thickets or woods; alluvium. (Eaton, 1958.) A single colony. Rare. (Local.)

4. ONOCLEA L. Sensitive Fern

1. **O. sensibilis** L. — Low open ground, wet meadows, thickets, alluvial woods. Often weedy. (Eaton, 1957.) Very common.
— **forma obtusilobata** (Schkuhr) Gilbert. (Miss Weir, n.c.d.; ex Herb. Hoar.) Occasional.

5. DRYOPTERIS Adans. Shield-Fern, Wood-Fern

Key: Man. p.31

1. **D. Thelypteris** (L.) Gray var. **pubescens** (Lawson) Nakai, (*Thelypteris palustris* (Salisb.) Schott, var. Fern.), Marsh-Fern. — Swamps, bogs, low woods and thickets. (Seymour, 1912.) Common. [Thor.]
2. **D. simulata** Davenp., (*T. simulata* Nieuwl.), Massachusetts Fern. — Mostly low, boggy woods and thickets. (Eaton, 1928, 1957.) Uncommon.
3. **D. noveboracensis** (L.) Gray, (*T. noveboracensis* Nieuwl.), New York Fern. — Dry to damp woods and thickets. (Eaton, 1957.) Very common. [Thor.]
4. **D. disjuncta** (Ledeb.) C.V. Mort., (*T. dryopteris* (L.) Slosson), Oak-Fern. — Cool mossy woods and banks. (H. Mann, Jr., ca. 1862; Kennedy, 1913.) Rare in eastern Massachusetts.
6. **D. Phegopteris** (L.) Christens., (*T. Phegopteris* Slosson),

- Beech-Fern.—Cool woods, thickets, rocky banks.
(Hosmer, n.c.d.; no other coll.) Rare. (Local.)
7. D. *hexagonoptera* (Michx.) Christens., (*T. hexagonoptera* Slosson), Broad Beech-Fern.—Rich woods. (Hosmer, n.c.d.) Rare. (Local.)
8. D. *spinulosa* (O.F. Muell.) Watt var. *spinulosa*, Wood-Fern.—Low, or cool dry woods, thickets. (Eaton, 1957.) Rather common.
- var. *fructuosa* (Gilbert) Trudell.—Woods, wet or dry. (Seymour, 1912.) Probably common. [Thor.]
- var. *intermedia* Muhl.—Woods, wet or dry. (Hoar, 1857.) Frequent.
- var. *concordiana* (Davenp.) Eastman, Purdie's Fern.—Low woods. (Purdie and Davenport, 1903.) Very local. Not recently collected, perhaps a transient mutant unworthy of taxonomic recognition. Cotypes at GH and NEBC. (See Rh. 6: 31, 1904.)
9. × D. *Boottii* (Tuckerm.) Underw., Boott's Wood-Fern.—Woods. (Seymour, 1912.) Infrequent. A postulated hybrid between *D. spinulosa* var. *intermedia* and *D. cristata*, generally distributed in eastern Massachusetts.
10. D. *cristata* (L.) Gray, Crested Wood-Fern.—Damp to wet woods and thickets, swampy open ground. (Hosmer, n.c.d.) Frequent. [Thor.]
14. D. *marginalis* (L.) Gray, Marginal Wood-Fern.—Shaded ledges, rocky wooded slopes, dry woods. (Hoar, 1857.) Rather common. [Thor.]

6. POLYSTICHUM Roth Shield-Fern

Key: Man. p.37

4. P. *acrostichoides* (Michx.) Schott, Christmas Fern.—Woods and rocky slopes. (Eaton, 1921.) Numerous stations, but scarce. [Thor.]

7. DENNSTAEDTIA Bernh.

1. D. *punctilobula* (Michx.) Moore, Hay-scented Fern.—Shady, rocky slopes and pastures, damp roadside banks. (Williams, 1908.) Common, often forming large dominant colonies. [Thor.]

8. ATHYRIUM Roth

Key: Man. p.39

2. A. *thelypteroides* (Michx.) Desv., Silvery Spleenwort.—

Rich woods, shaded slopes. (Eaton, 1958.) Very scarce, but not rare in eastern Massachusetts.

3. A. *Filix-femina* (L.) Roth var. *Michauxii* (Spreng.) Farw., Lady-Fern. — Damp thickets, meadows and swamps. (Seymour, 1912.) Common. [Thor. forma?]— *forma elatius* (Link) Clute. (Eaton, 1957.) Seemingly scarce.— *forma rubellum* (Gilbert) Farw. (Eaton, 1930.) Probably common.— *forma confertum* (Butters) Fern. (Eaton, 1957.) Perhaps uncommon.

11. ASPLENIUM L. Spleenwort

Key: Man. p.42

7. A. *Trichomanes* L., Maidenhair Spleenwort. — Shaded rock crevices, mostly calcareous. (Hoar, 1858.) Rare: two stations. (Uncommon in numerous localities in Middl. chiefly on metamorphic rocks containing traces of calcite.) [Thor.]
8. A. *platyneuron* (L.) Oakes, Ebony Spleenwort. — Wooded slopes, rock banks, ledge crevices, chiefly in circum-neutral soil. (Eaton, 1921, 1957.) Uncommon: two stations, including Estabrook Woods. (Frequent.) [Thor.]

12. WOODWARDIA Sm. Chain Fern

1. W. *virginica* (L.) Sm. — Acid bogs, swamps. (Hoar, 1858, from Ledum Bog (see Th. J. 11: 148) but station now apparently destroyed; Eaton, 1957, second known station where abundant.) Uncommon.

17. ADIANTUM L. Maidenhair

1. A. *pedatum* L., Maidenhair Fern. — Rich hardwoods. (Hoar, 1858; Eaton, 1930.) Four scattered stations, including Estabrook Woods. (Uncommon.) [Thor.]

18. PTERIDIUM Gleditsch Bracken

1. P. *aquininum* (L.) Kuhn var. *latiusculum* (Desv.) Underw., Brake. — Dry to moist pastures, clearings, sterile open woods. (Eaton, 1930.) Common. [Thor.]

19. POLYPODIUM L. Polypody

1. P. *virginianum* L., Rock Polypody. — Ledge crevices, shaded flat surfaces of rocks, tree bases. (Eaton, 1957.)

Not common; frequent in Estabrook Woods. (Frequent.) [Thor.]

Family 10. MARSILEACEAE (MARSILEA FAMILY)

1. MARSILEA L.

1. *M. quadrifolia* L.—Quiet ponds and streams. (Hoar, 1879.) According to Hoar, introduced by Minot Pratt from Harvard Botanic Garden to Concord and Sudbury rivers where it increased abundantly, but now scarce, owing perhaps to pollution. Abundant on Bateman's Pond. Introduced from Europe.

DIVISION II. SPERMATOPHYTA

(SEED-PLANTS, PHANEROGAMS OR FLOWERING PLANTS)

Subdivision I. GYMNOSPERMAE (Gymnosperms)

Family 12. TAXACEAE (YEW FAMILY)

1. TAXUS L. Yew

1. *T. canadensis* Marsh., American Yew.—Cool moist woods. (Hoar, 1858; Hoyle, 1901; Eaton, 1958; 1958.) Rare in eastern Massachusetts. See Th. J. 10: 506. [Thor.]

Family 13. PINACEAE (PINE FAMILY)

2. TSUGA (Endl.) Carr. Hemlock

1. *T. canadensis* (L.) Carr.—Cool wooded slopes; in Concord mostly northern exposures. (Eaton, 1935.) Frequent. A meagre remnant of a remarkable stand of ancient hemlocks along the bank of the Assabet River under Nashawtuc Hill still survives (1974).

3. PICEA Dietr. Spruce

Key: Man. p.54

3. *P. mariana* (Mill.) BSP. Black Spruce.—Locally, mostly in cold sphagnum bogs. (Eaton, 1921.) Scarce.
- P. *abies* (L.) Karst., Norway Spruce.—Woods and hedge-rows. (Eaton, 1935, 1961.) Occasionally spontaneous, near plantations (as in Town Forest) or horticultural specimens. Introduced from Europe.

4. LARIX Mill. Larch

1. *L. laricina* (DuRois) K. Koch, Tamarack.—Usually in sphagnum bogs, associated with Black Spruce, but

more abundant. (Eaton, 1922.) Scarce and local.
[Thor.]

- L. DECIDUA Mill., European Larch.—Leaves and cones longer, 2.5–3 mm and 2–3.5 cm respectively. Woods, dry or moist. (Eaton, 1935.) Occasionally spreads from cultivation, as in Concord Town Forest. Introduced from Europe.

5. PINUS L. Pine

Key: Man. p.55

1. P. STROBUS L., White Pine.—Chiefly dry woods and old fields, but tolerates wet or even swampy ground. (Eaton, 1935.) Very common. Many clear stands of mature trees destroyed by 1938 hurricane.
2. P. RESINOSA Ait., Red Pine.—Dry woods. (Fernald and Svenson, 1928.) As an indigenous species, a small grove of mature trees formerly stood on a gravel ridge opposite Sleepy Hollow Cemetery near Bedford Road. It was gradually destroyed by under-mining for gravel. A lingering individual may have provided Fernald and Svenson with their specimen. According to Pratt “a few trees [grew] on the south-east side of Merriam’s Hill” which is adjacent to Virginia Road near the Bedford line, and obviously known to Hoar, who gave the locality for a specimen of *Phytolacca americana* as “. . . near Red Pines, Virginia Rd.” Pratt also mentioned a station “on land of John Barrett near Buck School House,” and “a single tree in pasture of Brooks Bigelow, north of Ponkatasset [sic].” Many introduced plantings, e.g., Concord Town Forest, frequently reproduce spontaneously.
3. P. SYLVESTRIS L., Scotch Pine.—Roadsides, fallow fields, dry open woods. (Eaton, 1969.) Frequent escape from cultivation. Naturalized from Europe.
8. P. RIGIDA Mill., Pitch Pine.—Dry gravel, sandy, often barren soil. (Eaton, 1935.) Common. [Thor.]

8. CHAMAECYPARIS Spach White Cedar

1. C. THYOIDES (L.) BSP., White Cedar.—Swamps, sphagnous bogs. (Hoar, 1858; Eaton, 1921.) Both collections probably from same area where not recently observed; Hoar’s abundant colony apparently destroyed by wood-cutters. Rare. An entry in Thoreau’s Journal reads:

"To Annursnach [sic] and Cedar Swamp. . . . There are white cedars two feet through, the only ones I know in Concord. It was here were cut the cedar posts which Alcott put into Emerson's summer-house. They could not have been spared even for that." (Th. J. 5: 502-503.)

9. JUNIPERUS L. Juniper

Key: Man. p.59

1. *J. communis* L. var. *depressa* Pursh, Ground Juniper.— Dry pastures, open rock woods, roadside banks. (Eaton, 1935.) Common. [Thor.]
3. *J. virginiana* L. var. *crebra* Fern. & Griseb., Red Cedar.— Pastures, old fields, persisting in recent woodlands; best developed on circumneutral soils overlying glacial till. (Hoar, 1858.) Common. [Thor.]

Subdivision II. ANGIOSPERMAE (Angiosperms)

CLASS I. MONOCOTYLEDONEAE, Monocotyledons

Family 14. TYPHACEAE (CATTAIL FAMILY)

1. *TYPHA* L. Cattail Flag

Key: Man. p.60

1. *T. latifolia* L., Cattail.— Swamps, river meadows, shallow water. (Eaton, 1922.) Common, often forming extensive stands. [Thor.]
— *forma ambigua* (Sonder) Kronf. Infrequent.
2. *T. angustifolia* L., Narrow-leaved Cattail.— Chiefly in alkaline or basic waters. (Eaton, 1957.) Status as an indigenous plant in Concord doubtful. Abundant in the Great Meadows impoundments, following the extensive pollution from sewage in the mid-1930's. Not recorded from Great Meadows prior to their flooding.
3. *T. glauca* Godr.— Swamps, river meadows, shallow water. (Eaton, 1957.) Rare, a single locality reported.

Family 15. SPARGANIACEAE (BUR-REED FAMILY)

1. *SPARGANIUM* L. Bur-reed

Key: Man. p.61

1. *S. eurycarpum* Engelm.— Shallow water, edge of river and brook meadows. (Frohock, 1880.) Now common along the banks of the polluted river, with leaves of sterile clumps often 1.5 m tall. [Thor.]

2. *S. androcladum* (Englem.) Morong.—Shallow water, peaty or muddy shores. (Eaton, 1932.) Scarce.
3. *S. americanum* Nutt.—Similar habitats. (Eaton, 1922.) Rather common.
4. *S. chlorocarpum* Rydb.—Similar habitats. (Frohock, 1880.) Scarce. Collected from two stations.

Family 16. ZOSTERACEAE (PONDWEED FAMILY)

2. POTAMOGETON L. Pondweed

Key: Man. p.65

4. *P. Robbinsii* Oakes.—Still or gently flowing waters, rooting in mud. (Hoar, 1886; Deane, 1886.) Formerly not uncommon in Sudbury River. Present status of this and subsequent species of pondweeds uncertain, owing to pollution of the rivers.
5. *P. CRISPUS* L.—Muddy, mostly calcareous or brackish waters. (Eaton, 1932.) Locally abundant in Sudbury River. Infrequent elsewhere in eastern Massachusetts. Naturalized from Europe.
7. *P. zosteriformis* Fern.—Quiet ponds and streams. (Hellquist, 1971.) Uncommon. Found floating in Concord River.
13. *P. gemmiparus* Robbins.—Quiet ponds and streams. (Morong ex Herb. Hoar, 1886; Hosmer, n.d.) Uncommon; also two collections from Charles River.
17. *P. Berchtoldi* Fieber var. *polyphyllus* (Morong) Fern.—Shallow pools. (Eaton, 1956.) Rare. Known elsewhere in Massachusetts east of Berkshire Co. from So. Natick, Martha's Vineyard, and Clinton.
— var. *acuminatus* Fieber.—Quiet waters. (Churchill, 1895.) Formerly common.
— var. *lacunatus* (Hagstr.) Fern.—Quiet waters. (Eaton #5148, 1961.) Rare; represented also by a single collection from Concord River in Bedford.
20. *P. Spirillus* Tuckerm.—Quiet waters. (Thoreau, 1 August 1856; Hoar, 25 July.) Occasionally collected, probably common in the river.
22. *P. capillaceus* Poir.—Quiet, mostly acid waters. Hoar, 22 August.) Probably common. (General.)
24. *P. epihydrus* Raf. var. *Nuttallii* (C. & S.) Fern.—Pools, ponds, and slow streams. (Morong, 4 August, ex Herb. Hoar.) Common. Thor. Herb.: "Off Clamshell"; also

an unidentified Thoreau collection that appears to be the rare var. *epihydrus* but awaits the verdict of a specialist of the group.

28. **P. amplifolius** Tuckerm.—Ponds and slow streams. (Deane, 1886; Morong, 1886.) Probably common formerly. [Thor.]
29. **P. pulcher** Tuckerm.—Ponds and streams, slow or rapid. (Morong, 1886.) Uncommon.
30. **P. nodosus** Poir.—Ponds and streams, slow or rapid. (Hoar, 1887.) Uncommon, perhaps extirpated by later pollution.
31. **P. gramineus** L. var. **gramineus**.—Ponds and streams. (Hoar, 22 August; Hoar, n.d.) Formerly probably not uncommon. (Frequent.)
— var. **myriophyllus** Robbins.—Ponds and streams. (Hoar, 1888.) Uncommon.
33. **P. natans** L.—Ponds and slow streams. (Thoreau, "Assabet, July 27, '56"; Hoar, 8 Aug.) Common. Thor. Herb.
34. **P. Oakesianus** Robbins.—Acid peaty, sandy- or rocky-bottomed ponds. (Thoreau, Andromeda Pond, 31 July 1856; Eaton, 1929.) Uncommon. Thor. Herb. Thoreau also collected what appears to be this species at "Walden Aug. 6, '56." It is among three unnamed specimens in his herbarium.

Family 17. NAJADACEAE (NAIAD FAMILY)

1. **NAJAS** L. Naiad

Key: Man. p.81

2. **N. flexilis** (Willd.) Rostk. & Schmidt.—Slow streams and ponds. (Eaton, 1929.) Formerly abundant in Sudbury and Concord rivers, even choking the uppermost impoundment (privately owned) at Great Meadows. Recent attempts (1967, 1968) to collect specimens in Concord unavailing, possibly owing to excessive sewage pollution. Present status uncertain; colonies may persist in unpolluted backwaters and brooks.
5. **N. gracillima** (A. Br.) Magnus.—Muddy, peaty or sandy ponds and pools. (Eaton, 1957.) Collected from a single pond. Infrequent, possibly rare. (Frequent.)

Family 18. JUNCAGINACEAE (ARROW-GRASS FAMILY)

2. **SCHEUCHZERIA** L.

1. **S. palustris** L. var. **americana** Fern.—Sphagnum bogs,

peaty shores. (Eaton, 1957, sterile; 1958, fruiting material.) Rare. Now known from a single bog only, *viz.*: west end Harrington's Swamp, West Concord, where abundant. Thoreau found it growing abundantly in Gowing's Swamp in 1855, and alluded to it several times later on. (Th. J. 7: 111; 12: 196, etc.) Does it still grow there?

Family 19. ALISMATACEAE (WATER-PLANTAIN FAMILY)

1. ALISMA L.

Key: Man. p.84

2. A. **triviale** Pursh, Water-Plantain.—Riverbanks, meadow pools, muddy shores. (Brainerd, 1950.) Uncommon.
3. A. **subcordatum** Raf.—Similar habitats. (Hoar, 1857.) Common. [Thor.]

4. SAGITTARIA L. Arrowhead

Key: Man. p.87

1. S. **subulata** (L.) Buchenau var. **gracillima** (S. Wat.) J. G. Sm.—Deep water of slow streams. (Joyce, 1882; Hosmer, n.c.d.; Cummings, n.c.d.; L. E. Richardson, 1967.) This last specimen collected in Assabet River where abundant (a remarkable comeback after 75 or more years of severe chemical pollution from the woolen mills in Maynard), and noteworthy for exhibiting well-developed blades terminating the phyllodia.
7. S. **graminea** Michx.—Wet mud and sand, often in shallow water. (Eaton, 1922.) Often abundant at a few stations. [Thor.]
14. S. **latifolia** Willd. var. **latifolia**.—Wet mud and sand, riverbanks, and meadows. (Eaton, 1930.) Common.
——— **forma hastata** (Pursh) Robins. (Williams, 1896.)
——— **forma gracilis** (Pursh) Robins. (Hoar, 1857.) Common.
——— var. **obtusa** (Muhl.) Wieg. (Deane, 1893.) Common.

Family 21. HYDROCHARITACEAE (FROG'S-BIT FAMILY)

1. ELODEA Michx. Waterweed

Key: Man. p.93

2. E. **Nuttallii** (Planch.) St. John.—Slow streams and shallow waters. (Eaton, 1953.) Formerly abundant in the rivers; still present but status in doubt (1974).

Family 22. GRAMINEAE (GRASS FAMILY)

Represented in Middl. by Subfam. I Poacoideae, Tribes II, III, IV, V, VI, VII, VIII, IX; and Subfam. II Panicoideae, Tribes X, XI. For key to the tribes see Man. p. 95 (Subfam. I.) and p. 188 (Subfam. II.). The keys in Gleason (34), and Hitchcock and Chase (35) are very helpful alternatives.

Subfamily I. POACOIDEAE TRIBE II. FESTUCEAE Nees

Key: Man. p.96

2. BROMUS L. Brome-Grass

Key: Man. p.98

3. **B. ciliatus** L. var. **ciliatus**. — Thickets, moist slopes, meadows, and shores. (Hoar, n.d., "Wall of Painted Cup meadow.") Rare. (Occasional.) The common plant northward and in subalpine areas.
— var. **intonsus** Fern. — Similar habitats. (Thoreau, 1860.) Infrequent. The common plant southward and at low altitudes.
11. **B. SECALINUS** L. — Fields, waste places, etc. (Thoreau, 1860.) Occasional. Naturalized from Europe.
22. **B. TECTORUM** L. — Roadsides, fields, waste places. (Eaton, 1958.) Casual, as yet. (Frequent, sometimes abundant.) Naturalized from Europe.

4. FESTUCA L. Fescue Grass

Key: Man. p.104

5. **F. CAPILLATA** Lam. — Dry open soil. (Eaton, 1932.) Occasional. Apparently indigenous in Newfoundland, perhaps in Nova Scotia; introduced elsewhere.
7. **F. rubra** L. var. **rubra**. — Sandy, rocky, peaty soils. (Thoreau, 1859.) Frequent. (Common.) Two other varieties may occur in Concord.
9. **F. ELATIOR** L. — Fields, meadow, roadsides. (Thoreau, 1859.) Common, often weedy. Naturalized from Europe.

5. VULPIA K. C. Gmel.

Key: Man. p.107

3. **V. octoflora** (Walt.) Rydb. var. **tenella** (Willd.) Fern. — Dry, open soil. [Thoreau, n.c.d.; 2 July 1860: "Yesterday, I detected the smallest grass that I know, apparently *Festuca tenella* (?), in the dry path southwest

of the yew, only two to four inches high, like moss." (Th. J. 13: 383.) He went to Well Meadow on 1 July 1860, "returning over the causeway."] Uncommon. (Occasional.)

7. GLYCERIA R. Br. Manna-Grass

Key: Man. p.111

1. **G. borealis** (Nash) Batchelder.— Wet places, shallow water. (Hoar, 1858.) Uncommon. (Infrequent in southern New England.)
2. **G. septentrionalis** Hitchc.— Swamps, meadows, wet woods. (Thoreau, 1857.) Uncommon. Concord is near north-eastern limit of range.
5. **G. acutiflora** Torr.— Muddy pools and pond margins. (Thoreau, 1860; "Laurel Glen Pool," where near north-eastern limit of range.) Rare. (Uncommon.)
7. **G. obtusa** (Muhl.) Trin.— Peaty and wet sandy soils. (Thoreau, 1859.) Common.
8. **G. canadensis** (Michx.) Trin.— Bogs, meadows, damp shores. (Hoar, 1858.) Common.
10. **G. striata** (Lam.) Hitchc. var. **striata**, Fowl-meadow Grass.— Moist ground. (Eaton, 1956.) Common.
— var. **stricta** (Scribn.) Fern. (Thoreau, 1859, "R. W. E.'s meadow — boat's place [sic], not quite fowl meadow.") Rare. Four stations in Massachusetts, undocumented from Rhode Island or Connecticut.
11. **G. grandis** S. Wats., Reed-meadow Grass. (Thoreau, 1859.) Frequent.
13. **G. pallida** (Torr.) Trin., (*Torreyochloa* Church).— Pools, meadow sloughs, pond margins. (Thoreau, 1859.) Not common.
14. **G. Fernaldii** (Hitchc.) St. John (*Torreyochloa* Church).— Shallow water and wet places. (Eaton, 1937.) Rare. (Uncommon.)

9. POA L. Meadow Grass

Key: Man. p.115

1. **P. ANNUA** L., Low Spear Grass.— Cultivated ground, waste places. (Thoreau, 1859.) Very common. Naturalized from Europe.
3. **P. COMPRESSA** L., Canada Bluegrass. Dry soil. (Thoreau, 1859.) Common. Naturalized from Eurasia.
4. **P. pratensis** L., Kentucky Bluegrass, Speargrass.— Moist fields, meadows, shores, etc. (Hoar, 1858.) Common.

5. **P. angustifolia** L. — Dry open woods and clearings. (Eaton, 1958.) Apparently rare in southern New England, being known from seven towns in Massachusetts; not yet documented from Rhode Island or Connecticut.
9. **P. trivialis** L. — Springheads, brooksides, wet glades, etc. (Hoar, "28 June; S. Hoar's spring," where probably indigenous.) Uncommon. (Known from six towns in Middl.)
19. **P. palustris** L., Fowl-meadow Grass. — Meadows, shores, moist thickets. (Thoreau, 1859.) Frequent.

12. DACTYLIS L. Orchard Grass

1. **D. GLOMERATA** L. var. **GLOMERATA**, Orchard Grass.—Fields, roadsides, waste ground. (Eaton, 1957.) Common. Naturalized from Europe.

13. ERAGROSTIS Beauv. Love Grass

Key: Man. p.122

7. **E. pectinacea** (Michx.) Nees. — Sandy shores, dry fields, sometimes weedy in cultivated ground. (Eaton, 1961.) Not common.
15. **E. spectabilis** (Pursh) Steud. var. **sparsihirsuta** Farw., Tumble-grass. — Dry fields, sterile soil, roadside banks, etc. (Thoreau, 1858.) Common.

21. TRIODIA R. Br.

Key: Man. p.129

1. **T. FLAVA** (L.) Smyth, Tall Red-Top. — Old fields. (Eaton, 1934.) Adventive from farther west at a single station where abundant, but now mostly, if not completely, eradicated by new building operations (see Rh. 38: 64–67). (Scattered stations in New England except in northwestern Connecticut where frequent.)

25. PHRAGMITES Trin. Reed

1. **P. communis** Trin. var. **Berlandieri** (Fourn.) Fern., (*P. australis* (Cav.) Trin. ex Steud. var. (Fourn.) Clayton). — Circumneutral, fresh to alkaline and brackish estuarine marshes, pond shores, ditches, etc. (Eaton, 1968.) A single vigorous colony discovered by David Grice about 1938 growing within the boundary of an excavation for gravel for construction of a dyke at the Great Meadows impoundments completed about 1929, thus

fixing the earliest possible date of its appearance at this station. It is believed to have become established in the mid-1930's, when the Concord River suddenly became severely polluted by sewage (which is basic in character). A probable source is a large, mostly sterile, colony upriver in the Sudbury meadows, from which rhizomes detached by anchor ice or muskrats may have floated downstream and found lodgement in a suitable place. Another large and conspicuous colony has developed in recent years in a meadow of the Concord River in Carlisle. This latter station surely would not have been overlooked in the early years of the century, had it existed then. (Infrequent colonies in border towns of eastern Middl.)

TRIBE III. HORDEAE Lindl.

Key: Man. p.132

28. AGROPYRON Gaertn.

Key: Man. p.133

1. A. *trachycaulum* (Link) Malte var. *glaucum* (Pease & Moore) Malte. — Rocky or gravelly shores, boggy places. (Thoreau, 1859.) Infrequent; four stations. (Uncommon.)

6. A. *REPENS* (L.) Beauv. var. *REPENS*, Witch Grass. — Gardens, fields, roadsides, waste places. A highly variable species of European origin, various forms of which comprise an aggressive weedy complex. *Forma repens* not yet noticed in Concord.

— *forma TRICORRHACHIS* Rohlena. (Williams, 1908.)
Abundant.

— *forma PILOSUM* (Scribn.) Fern. (Eaton, 1958.) Uncommon.

TRITICUM L. Wheat

- T. *AESTIVUM* L., Wheat. — Fields, waste ground. (Eaton, 1959.) Scattered stations, seldom persisting. Adventive from Eurasia.

SECALE L. Rye

- S. *CEREALE* L., Rye. — Fields, waste ground, road shoulders. (Eaton, 1959.) An increasingly common adventive from Eurasia, widely planted on road banks as shade crop for grasses.

33. ELYMUS L. Wild Rye, Lyme-Grass

Key: Man. p.139

2. E. virginicus L. Rich thickets and shores. (Thoreau, 1858; Hoar, 20 Aug.; Eaton #6195, 1968.) Uncommon; two stations. Infrequent.

34. HYSTRIX Moench Bottle-brush Grass

1. H. patula Moench var. *Bigeloviana* (Fern.) Deam, (*Elymus hystrix* L.).—Rich, rocky woods. (Hoar, 1858; Thoreau, 1859; Eaton, 1957. All from same area at Conantum on "Marlboro Formation.") Rare. (Local in eastern Massachusetts.)

TRIBE IV. AVENEAE Nees

Key: Man. p.142

35. ARRHENATHERUM Beauv. Oat-Grass

1. A. ELATIUS (L.) Mert. & Koch, Tall Oat-Grass.—Fields and roadsides. (Hoar, 21 June.) Not common. Naturalized from Europe.

36. HOLCUS L.

1. H. LANATUS L., Velvet Grass.—Sterile fields and former pastures. (Frohock, 1880.) Not common. (Common.) Naturalized from Europe. Th. J. 1 July 1859; 29 June 1860.

39. TRISETUM L.

Key: Man. p.145

1. T. spicatum (L.) Richter var. *molle* (Michx.) Beal.—Pond and river shores. (Jenks and Swan, 1888.) Rare.
3. T. pensylvanicum (L.) Beauv.—Springheads, meadows, wooded swamps. (Thoreau, 1857, 1859; Eaton, 1961.) Rare.

40. AVENA L. Oat

2. A. SATIVA L., Oat.—Fields and waste places. (Thoreau, 1859.) Frequent escape from cultivation, seldom persisting. Introduced from Eurasia.

41. DESCHAMPSIA Beauv. Hairgrass

1. D. flexuosa (L.) Trin., Common Hairgrass.—Dry open or partially shaded ground. (Thoreau, 1860; Hoar, 1874.) Common.

44. DANTHONIA DC. Wild Oat-Grass

Key: Man. p.148

1. D. spicata (L.) Beauv., Poverty Grass.—Dry ground,

sterile fields and thin woods. (Thoreau, 1859.) Very common.

2. **D. Alleni** Aust. — Dry clearings, arid open ground, rocky woods. (Thoreau, 1858, 1859.) Rare. (Occasional.)

TRIBE V. AGROSTIDEAE Kunth

Key: Man. p.151

45. **SPOROBOLUS** R. Br. Drop-seed

Key: Man. p.152

2. **S. vaginiflorus** (Torr.) Wood, Poverty Grass. — Dry, open, sterile soil. (Williams, 1896.) Frequent.

46. **CALAMAGROSTIS** Adanson Reed-Bentgrass

Key: Man. p.154

9. **C. canadensis** (Michx.) Nutt., Blue-joint. — Meadows, swampy ground, wet thickets. (Thoreau, 1856.) Common.

10. **C. cinnoides** (Muhl.) Bart. — Damp, open, sandy or peaty soils. (Thoreau, 26 Aug.; Eaton, 1930.) Uncommon.

49. **AGROSTIS** L. Bentgrass

Key: Man. p.159

2. **A. ALBA** L. var. **ALBA** (*A. stolonifera* L.), Redtop. For nomenclature, see Woss in Rh. 68: 437. — Dry and moist soils, fields and roadsides. (Hoar, 22 July.) Indigenous northward; probably introduced in Concord. Common.

— var. **palustris** (Huds.) Pers., Creeping-Bent. — Sloughs, shores, shallow water. (Eaton, 1932.) Not common. Indigenous.

4. **A. TENUIS** Sibth., Rhode Island Bent. — Fields, roadsides, thickets, etc. (Deane, 1887.) Common. Naturalized from Europe.

6. **A. scabra** Willd., Hairgrass. — Sterile, exsiccated or dry open soil. (Thoreau, 1858.) Common.

9. **A. perennans** (Walt.) Tuckerm. var. **perennans**, Upland Bent. — Open woods, rocky banks, dryish soil. (Thoreau, 4 Sept.; Eaton, 1958.) Apparently uncommon.

— var. **aestivalis** Vasey. — Woods, shaded banks and shores. (Hoar, 9 July.) Frequent.

10. **A. CANINA** L. — Sterile fields, exsiccated peats, pastures.

(Hoar, 8 July, 18 July.) Uncommon. Introduced from farther north.

51. CINNA L. Wood Reedgrass

Key: Man. p.164

1. C. arundinacea L., Wood Reedgrass. — Moist woods, shaded swamps. (Thoreau, 1 Sept. 1859.) Common.

53. PHLEUM L. Timothy

1. P. PRATENSE L., Common Timothy. — Fields, roadsides. (Thoreau, 6 Sept.) Common. Escaped from cultivation and naturalized from Europe.

54. ALOPECURUS L. Foxtail

Key: Man. p.166

2. A. PRATENSIS L., Meadow Foxtail. — Meadows, fields. (Thoreau, 1859.) Common. Introduced and naturalized from Europe.
3. A. GENICULATUS L., Marsh Foxtail. — Ditches, pools, moist open soil. (Thoreau 1859.) Uncommon. Naturalized from Europe.
5. A. aequalis Sobol. — Shallow water, shores, ditches. (H. Mann, Jr., 1862.) Uncommon.

55. MUHLENBERGIA Schreb.

Key: Man. p.167

3. M. Schreberi J. F. Gmel., Drop-seed, Nimble Will. — Woodlands, thickets, and weedy in gardens, roadsides, etc. (Eaton, 1958.) Occasional in natural habitats; sometimes a troublesome weed.
5. M. sobolifera (Muhl.) Trin. — Rocky woods, ledges. (Hoar, 6 Sept.; Thoreau, 18 Sept.; Eaton, 1959; all from Marlboro Formation.) Rare. (Occasional.)
7. M. sylvatica Torr. — Damp woods and thickets, banks of streams. (Eaton, 1961.) Rare. (Occasional in eastern Middl.)
— forma attenuata (Scribn.) Palmer & Steyermark.
(Hoar, 24 Sept.) Rare. (Occasional.)
8. M. mexicana (L.) Trin. — Shores, damp clearings, thickets. (Thoreau, "Sept. 9th, Lee's Cliff in prime.") Apparently rare. (Uncommon.)
10. M. frondosa (Poir.) Fern. — Moist open woods, shores,

and sometimes weedy in shrubberies, shady roadsides, etc. (Eaton, 1932, 1959.) Becoming common.

— *forma commutata* (Scribn.) Fern. (Eaton, 1961.) Uncommon.

13. *M. glomerata* (Willd.) Trin. var. *cinnoides* (Link) F. J. Herm. — Bogs, swamps, peaty meadows, shores. (Thoreau, 1 Sept.) Rare. Only four stations in Massachusetts east of Worcester Co. of which three in Middl.
14. *M. uniflora* (Muhl.) Fern. — Meadows, bogs, sandy shores, etc. (Hoar, 3 Sept.) Common.

56. **BRACHYELYTRUM** Beauv.

1. *B. erectum* (Schreb.) Beauv. var. *septentrionale* Babel. — Cool, dry to moist woods. (Hoar, 25 July; Eaton, 1956.) Rare; two stations. (Occasional in eleven towns.)

57. **ORYZOPSIS** Michx. Mountain-Rice

Key: Man. p.172

3. *O. pungens* (Torr.) Hitchc. — Dry, sandy fields, rocky open woods. (Thoreau, 1859.) Not uncommon.

59. **ARISTIDA** L. Triple-awned Grass

Key: Man. p.174

7. *A. dichotoma* Michx., Poverty-Grass. — Dry sandy soils. (Thoreau, 1858.) Rather common.
11. *A. purpurascens* Poir. — Dry sandy soils, sandy beaches, etc. (Hoar, n.c.d.) Uncommon. Here near northeastern limit of range.

TRIBE VI. **CHLORIDEAE** Kunth

Key: Man. p.178

61. **SPARTINA** Schreb. Cord-Grass

Key: Man. p.179

1. *S. pectinata* Link, Freshwater Cord-Grass. — Meadows, shores, wet ditches. (Hoar, 1887.) Common in the river meadows.

TRIBE VII. **PHALARIDEAE** Link

Key: Man. p.185

74. **PHALARIS** L. Canary-Grass

1. *P. CANARIENSIS* L., Canary-Grass. — Waste places, roadsides. (Hosmer, n.c.d.) Rare. (Occasional.) Adventive from Europe.

3. **P. arundinacea** L., Reed-Canary Grass.—River and brook meadows, shores, etc. (Thoreau, 1859.) Common, often the dominant vegetation in large stands, formerly affording favorite nesting sites for the now rare Short-billed Marsh-Wren.

75. **ANTHOXANTHUM** L. Sweet Vernal Grass

1. **A. ODORATUM** L.—Fields, roadsides, orchards. (Thoreau, 1858.) Very common. Naturalized from Europe.
2. **A. PUELII** Lecoq & Lamotte.—Dry fields, rocky open woods, waste places. (Eaton, 1932.) Rare. Local elsewhere. Naturalized from Europe.

76. **HIEROCHLOË** R. Br. Holy Grass

1. **H. odorata** (L.) Beauv., Sweet Grass.—Meadows, swales, shores. (Hoar, 1858.) Rare. (Local inland, common along coast.) Long leaves of vegetative shoots used by Indians for basketry.

TRIBE VIII. **ORYZAEAE** Kunth

77. **LEERSIA** Sw. Cutgrass

2. **L. oryzoides** (L.) Sw., Rice-Cutgrass.—Meadows, shores, wet open places. (Thoreau, 1858.) Common.

TRIBE IX. **ZIZANIEAE** Hitchc.

Key: Man. p.187

79. **ZIZANIA** L. Wild Rice

1. **Z. aquatica** L. var. **aquatica**.—Wet meadows, riverbanks, often in shallow water. (Eaton, 1920.) Formerly scattered along riverbanks, now locally abundant. (Frequent.) Grains attractive to ducks and rails.

Subfamily II. **PANICOIDEAE**

TRIBE X. **PANICEAE** R. Br.

Key: Man. p.189

80. **DIGITARIA** Heist. Finger Grass

Key: Man. p.190

1. **D. filiformis** (L.) Koel.—Dry sandy, sterile soils. (Thoreau, 1858.) Formerly scattered stations, now rare. (Occasional.)
3. **D. ISCHAEMUM** (Schreb.) Muhl.—Lawns, cultivated and waste ground. (Eaton, 1958.) Becoming common. Less

obnoxious than following species. Naturalized from Europe.

5. *D. SANGUINALIS* (L.) Scop., Common Crab Grass.—Dry sandy to rich cultivated soil. (Eaton, 1957.) An obnoxious, ubiquitous weed. Naturalized from Old World.

83. *PASPALUM* L.

Key: Man. p.191

10. *P. ciliatifolium* Michx. var. *Muhlenbergii* (Nash) Fern.—Sandy, usually dry fields and roadsides. (Thoreau, 24 Aug.) Common. The only species in Middl.

85. *PANICUM* L. Panic Grass

Key: Man. p.195

4. *P. dichotomiflorum* Michx. var. *dichotomiflorum*.—Low ground, riverbanks, sometimes weedy in cultivated ground. (Eaton, 1961.) Infrequent.

— var. *geniculatum* (Wood) Fern.—Similiar habitats. (Eaton, 1957.) Common, sometimes an aggressive weed.

6. *P. capillare* L. var. *capillare*, Old-Witch Grass.—Sandy, gravelly soils, or weedy in cultivated land. (Hoar, 1858.) Frequent.

— var. *occidentale* Rydb.—Similar habitats. (Thoreau, 5 Sept.) Common; more weedy than preceding.

7. *P. philadelphicum* Bernh. (Determined by T. R. Soderstrom.) — Sandy or rocky soils, alluvial banks. (Eaton, #5126.) Rare; a single collection only. (Local in New England except southwestern Connecticut.)

10. *P. MILIACEUM* L., Millet.—Waste places. (Thoreau, 12 Sept.) Adventive from Europe; a rarely persistent escape from cultivation.

11. *P. virgatum* L. var. *spissum* Linder, Switchgrass.—Dry to moist sandy shores, margins of meadows, fields. (Thoreau, 28 Aug.) Rare; not recently seen. (Locally common near the coast.)

16. *P. agrostoides* Spreng. var. *agrostoides*.—Meadows, riverbanks, sand, or peaty shores. (Thoreau, 1858.) Frequent.

19. *P. depauperatum* Muhl. var. *psilophyllum* Fern.—Dry sandy, open soil. (Thoreau, 1859.) Common.

21. *P. linearifolium* Scribn. var. *linearifolium*.—Dry gravelly

- soil, open woods and fields. (Eaton, 1930.) Occasional.
 — var. **Wernerii** (Scribn.) Fern. — Similar habitats. (Eaton, 1930.) Common.
34. **P. boreale** Nash. — Shores, meadows, moist fields and open woods. (Eaton, 1956.) Occasional.
35. **P. dichotomum** L. — Dry thin woods, openings. (Thoreau, 1859.) Common.
40. **P. spretum** Schultes. — Wet peats and sand, swampy places. (Thoreau, 1858.) Common.
44. **P. meridionale** Ashe. — Dry open places, thin woods. (Eaton, 1961.) Rare. (Uncommon.)
45. **P. lanuginosum** Ell. var. **lanuginosum**. — Dry sandy soil, thin woods, etc. (Hoar, n.d.; Eaton, 1929.) Common.
 — var. **implicatum** (Scribn.) Fern. — Similar habitats. (Eaton, 1932.) Common.
 — var. **Lindheimeri** (Nash) Fern. — Similar habitats. (Eaton, 1959.) Apparently rare. (Local.)
52. **P. columbianum** Scribn. — Dry or sandy open ground or thin woods. (Deane, 1911; Eaton, 1961.) Frequent in Ball's Hill area. (Uncommon.)
62. **P. oligosanthes** Schultes var. **Scribnerianum** (Nash) Fern. — Dry, thin soils, fields and thin woods. (Thoreau, 1858.) Frequent.
74. **P. clandestinum** L. — Dry or moist shores, thickets, borders of alluvial woods. (Perkins, "Concord or vic.", 1880; Eaton, 1936.) Frequent. Usually occurs as large clones.
75. **P. latifolium** L. — Usually dry open rich, or rocky woods. (Thoreau, 1858; Hoar, 18 Sept.) Apparently rare. (Infrequent.) There is a curious annotation in Thoreau's handwriting on the mounting paper reading "low and spreading, whorled pogonia field." For author's comments, see entry under *Isotria*, p. 98.

87. ECHINOCHLOA Beauv.

Key: Man. p.223

3. **E. CRUGGALLI** (L.) Beauv., Barnyard Grass. — Waste and cultivated ground. (Thoreau, 1858.) An abundant weed. Naturalized from Old World.
 — forma **LONGISETA** (Trin.) Farw. — Similiar habitats. (Williams, 1908.) Less common, but frequent. Naturalized from Old World.

4. *E. pungens* (Poir.) Rydb. var. *pungens*.—Low open ground, riverbanks, shores. (Eaton, 1931, 1965.) Apparently rare. (Uncommon.)
5. *E. Walteri* (Pursh) Nash.—Basic to alkaline swamps, marshes, and shallow water. (Eaton, 1956.) Abundant at a single station. (Rare.)

89. *SETARIA* Beauv. Bristly Foxtail

Key: Man. p.225

2. *S. GLAUCA* (L.) Beauv., Foxtail.—Cultivated ground, roadsides, waste places, etc. (Hoar, 1858.) Abundant weed. Naturalized from Eurasia.
4. *S. VIRIDIS* (L.) Beauv., Bottle-Grass.—Similar habitats. (Hoar, 1858.) Common weed of cultivated ground. Naturalized from Eurasia.

TRIBE XI. ANDROPOGONEAE Presl

Key: Man. p.228

95. *ANDROPOGON* L. Beardgrass

Key: Man. p.230

1. *A. scoparius* Michx. var. *scoparius forma calvescens* Fern.—Dry fields, open woods and clearings. (Eaton, 1932.) Very rare. Known elsewhere in Massachusetts from Jamaica Plain, Cuttyhunk, and Nantucket.
—var. *frequens* F. T. Hubbard, Broom, Wiregrass.—Dry, usually sterile fields and sandy places. (Thoreau, 1850.) Abundant. Conspicuous and attractive, particularly in late autumn.
3. *A. Gerardi* Vitman.—Dry to moist open ground. (Hoar, 1858.) Not common, but widely distributed in Middl.

Family 23. CYPERACEAE (SEDGE FAMILY)

Key: Man. p.236

1. *CYPERUS* L.

A difficult genus. Material should exhibit rhizomes (or bases of annual species) and mature (ripe) spikelets to be readily identifiable.

3. *C. diandrus* Torr.—Wet sandy, peaty, muddy soils. (Eaton, 1931.) Uncommon. (Frequent, sometimes abundant elsewhere in Middl.)
4. *C. rivularis* Kunth.—Similar habitats. (Thoreau, n.d.) Uncommon. (Less frequent than preceding.) Some

specialists consider this and No. 3 conspecific, thus relegating this to synonymy.

13. C. *erythrorhizos* Muhl. — Sandy shores, moist alluvium. (Brainerd, 1957, Great Meadows; Eaton, 1957, Walden Pond.) Rare. Not reported from the entire Merrimack River drainage system except from Concord and doubtfully from Bedford.
22. C. *esculentus* L., Yellow Nutgrass. — Damp, sandy, or loamy soil. (Hoar, 1858.) Common; often a troublesome weed of cultivated ground and lawns.
24. C. *dentatus* Torr. — Sandy or gravelly shores and damp sands. (Thoreau, 1858.) Common.
25. C. *strigosus* L. — Sandy or gravelly shores, damp loams. (Hoar, 1858.) Common; often weedy.
34. C. *filiculmis* Vahl var. *macilentus* Fern. — Dry rocky, sandy, gravelly soils. (Hoar, 1858.) Common; often a weed of railroad ballast and road shoulders.

2. DULICHIUM Pers.

1. D. *arundinaceum* (L.) Britt. — Wet places, generally in standing water. (Hoar, 1858.) Frequent. (Common.) [Thor.]

3. ELEOCHARIS R. Br. Spike-Rush

Key: Man. p.249

3. E. *Robbinsii* Oakes. — Pond margins, peaty pools, shallow backwaters. (Eaton, 1932.) Rare. (Occasional.)
7. E. *acicularis* (L.) R. & S. — Sandy or muddy shores, exposed flats. (Eaton, 1929.) Common. Often forming a dense turf.
— *forma longicaulis* (Desmaz.) Hegi. — Submerged muds or sands. (Eaton, 1929.) Infrequent. A commonly sterile state with much elongated culms and basal leaves.
10. E. *olivacea* Torr. — Wet muds, sands and peats. (Eaton, 1961.) Known from a single station, where abundant. (Infrequent.)
15. E. *obtusa* (Willd.) Schultes var. *obtusa*. — River and brook meadows, wet muds and sands. (Hoar, 1858.) Common.
— var. *jejuna* Fern. — Similar habitats. (Williams, 1897; specimen in GH.) Much less common. Perhaps better treated as a form.

- [25. *E. palustris* (L.) R. & S. var. *major* Sonder.—Shallow or even deep water, often on exposed muds. Concord material and probably all eastern North American material which has been passing for this species should be referred to *E. Smallii* Britt., possibly as an ecological variant. See Svenson in Rh. 49: 62ff.]
26. *E. Smallii* Britt.—Peaty meadows and swamps or wet sands. (Thoreau, 1859.) Common.
35. *E. tenuis* (Willd.) Schultes.—Similar habitats and even dryish sands and peats. (Deane, 1886.) Rather common. (Common.)
36. *E. elliptica* Kunth.—Similar habitats, occasionally swampy woods. (Eaton, 1921.) Uncommon. (Frequent.)
6. *BULBOSTYLLIS* (Kunth) C. B. Clarke
1. *B. capillaris* (L.) C. B. Clarke var. *crebra* Fern.—Dry, chiefly sandy or gravelly soils. (Hoar, 1858.) Common, often abundant, especially on road shoulders. Our only species.
7. *FIMBRISTYLLIS* Vahl
6. *F. autumnalis* (L.) R. & S.—Sandy or peaty shores and low ground. (Perkins, 1886.) Uncommon. (Frequent.) Our only species.
8. *SCIRPUS* L. Bulrush
Key: Man. p.262
10. *S. Purshianus* Fern.—Peaty, muddy, sandy shores, and swamps. (Perkins, 1888.) Rather common.
12. *S. subterminalis* Torr.—Submerged in slow, often deep (1.5 m or more) streams, dead waters and ponds; emersed form occurs on peaty shores, quaking bogs. (Hoar, 8 Aug., a sterile specimen; Deane, 1886, Assabet River where still common in 1974.) Abundant in Assabet River. (Frequent.)
13. *S. Torreyi* Olney.—Muddy shores of ponds and dead waters. (Perkins, 1881; Eaton, 1930.) Locally abundant at a single station in years of low water. (Uncommon.)
16. *S. validus* Vahl var. *creber* Fern.—Riverbanks and meadows, usually in shallow water. (Hoar, 1858.) Common.

- *forma megastachyus* Fern. (Thoreau, n.d.) Uncommon in river meadow sloughs.
21. *S. fluviatilis* (Torr.) Gray.—Meadows, pond shores, the soils often basic, frequently in shallow water. (Eaton, 1960.) Rare. (See Introduction, p. 17)
25. *S. rubrotinctus* Fern.—River meadows, shores, damp open soil. (Thoreau, n.d.) Common.
27. *S. atrovirens* Willd. var. *georgianus* (Harper) Fern.—Similar habitats. (Eaton, 1931.) Common.
34. *S. cyperinus* (L.) Kunth var. *cyperinus*.—Wet meadows, shores, swampy mowings. (Hoar, 1858.) Common.
— var. *pelius* Fern.—Similar habitats. (Eaton, 1930.) Common.
37. *S. atrocinctus* Fern.—Wet meadows, swamps. (Thoreau, n.d.; Eaton, 1959.) Uncommon. (Frequent.) Two specimens of this species mis-named *S. eriophorum* in Th. Herb.: 1) "Wheeler's Meadow," 2) "R. Brown's Meadow," hence definitely from Concord.
- *forma brachypodus* (Fern.) S. F. Blake. (Griscom, 1931.) Uncommon.
38. *S. Longii* Fern.—Wet meadows, swamps. (Thoreau, 1859; Brainerd, 1950). Both from the Great Meadows. Rare.

9. ERIOPHORUM L. Cotton-grass

Key: Man. p.276

5. *E. spissum* Fern.—Sphagnum bogs. (Thoreau, n.d.; Hoar, 1858.) Local and scarce; confined to about four sphagnum bogs. (Local.)
7. *E. tenellum* Nutt.—Peaty meadows, bogs. (Thoreau, 1859.) Frequent, but scarce.
9. *E. viridi-carinatum* (Engelm.) Fern.—Peaty meadows, bogs and shores. (Thoreau, 1859.) Uncommon. (General, often abundant.) [Thor.]
10. *E. virginicum* L.—Bogs, peaty meadows, and shores. (Hoar, 1858; Thoreau, 1858.) Frequent. (Common.) [Thor.]

13. RHYNCHOSPORA Vahl Beak-rush

Key: Man. p.281

8. *R. capitellata* (Michx.) Vahl.—Wet meadows, peaty shores, bogs. (Hoar, n.d.) Rather common.
9. *R. alba* (L.) Vahl.—Bogs, peaty sands, and shores. (Hoar, 1859.) Uncommon. (Common.)

14. *R. fusca* (L.) Ait. f. — Bogs, wet peat or sand. (Thoreau, 1858, 1859). Apparently rare. (Frequent.)

14. CLADIUM P. Br. Twig-rush

1. *C. mariscoides* (Muhl.) Torr. — Peaty swamps, pond shores, wet sands. (Eaton, 1957, 1958.) Rare. A single station, destroyed *ca.* 1963. (General, but uncommon.)

15. SCLERIA Bergius Nut-rush

1. *S. triglomerata* Michx. — Dry to moist open woods and wood margins. (Hoar, n.d.) Rare; a single collection from a single station. (Rare: So. Sudbury, W. P. Rich, 1899.)

18. CAREX L. Sedge

A large critical world-wide genus, of which 267 species are maintained by Fernald (Man.). Specimens collected in Concord, an area of 27 square miles, represent 72 species or about 27 percent of those known to occur throughout the Manual range. The study of *Carex* should be attempted only with fully mature and complete specimens (*i.e.*, including rhizomes, basal leaves, sterile and fruiting culms). A good 7 \times hand lens is usually sufficient to observe key characters.

Subgenus I. VIGNEA (Beauv.) Kükenth.

Key: Man. p.294

§7. ARENARIAE Kunth

12. *C. foenea* Willd. — Dry, often sterile open soil. (Eaton, 1930.) Uncommon. (Widely distributed.)

§9. BRACTEOSAE Kunth

Key: Man. p.304

15. *C. retroflexa* Muhl. — Dry rocky or sandy woods. (Eaton, 1959, two stations on wooded outcroppings of Marlboro Formation.) Rare. (Infrequent and scarce.)

17. *C. convoluta* Mackenz. — Dry woods and moist wooded slopes. (Thoreau, 1860.) Common.

19. *C. radiata* (Wahlenb.) Dew. — Open woods and swamps. (Eaton, 1930.) Locally rather common. (Infrequent, perhaps overlooked.)

20. *C. cephalophora* Muhl. — Dry woods, openings, mowings. (Hoar, n.d.) Frequent.

24. *C. SPICATA* Huds. — Dry fields, roadsides, orchards. (Hoar, 18 July.) Scarce. Widely distributed. Naturalized from Eurasia.

26. *C. Muhlenbergii* Schkuhr. — Dry woods and fields. (Thoreau, 1860.) Rather common.

§10. MULTIFLORAE Kunth

Key: Man. p.308

34. *C. vulpinoidea* Michx. — Low ground, pond and stream margins. (Hoar, 7 July.) Common.

35. *C. annectens* Bickn. var. *annectens*. — Dry, or moist, often sandy, open soils. (Eaton, 1963.) Rather common.

- var. *xanthocarpa* (Bickn.) Wieg. — Similar habitats. (Eaton, 1934.) Uncommon.

§11. PANICULATAE Kunth

A single species with us.

39. *C. prairea* Dew. — Bogs, meadows, wet thickets. (Hoar, 30 June.) Very rare, not collected since.

§12. VULPINAE Kunth

Key: Man. p.310

43. *C. stipata* Muhl. — Low grounds, river and pond margins. (Hoar, 1858: poor, immature specimen; Bailey, 1886.) Common.

§13. HELEONASTES Kunth

Key: Man. p.311

47. *C. disperma* Dew. — Mossy, or damp wooded banks and clearings. (Thoreau, 1860; Eaton, 1958.) Rare. (Infrequent.)

48. *C. trisperma* Dew. — Mossy woods, swamps and bogs. (Thoreau, 1859.) Specimens from four stations. (Frequent.)

52. *C. canescens* L. var. *disjuncta* Fern. — Swamps, bogs. (Thoreau, 1859.) Common.

- var. *subfoliacea* Laestad. (Eaton, 1932.) Not common.

53. *C. brunnescens* (Pers.) Poir. var. *sphaerostachya* (Tuckerm.) Kükenth. — Dry or moist open woods. (Thoreau, n.d.; Eaton, 1958.) Uncommon in Middl.

§15. STELLULATAE Kunth

Key: Man. p.315

57. *C. exilis* Dew. — Sphagnum bogs, open peaty meadows and swamps. (Hoar, 1890; Boott, ex Herb. A. Gray, n.d.) Rare. (Occasional, but often locally abundant.)

60. **C. interior** Bailey. — Damp or wet, often calcareous soils. (Eaton, 1958.) Rare. (Only two other collections from Middl.)
61. **C. Howei** Mackenz. — Sphagnous bogs, mossy wooded swamps. (Hoar, 15 June; Eaton, 1958.) Uncommon. (Frequent.)
66. **C. incomperta** Bickn. (Recently treated as *C. atlantica* Bailey var. *incomperta* (Bickn.) F. J. Herm.) — Swampy, peaty woods. (Thoreau, 1859.) Rare. (Occasional.)
68. **C. cephalantha** (Bailey) Bickn. — Peaty swamps, meadows and shores. (Eaton, 1932.) Common.
69. **C. angustior** Mackenz. — Similar habitats. (Hoar, 11 June; Thoreau, n.d., mounted on a sheet of *C. incomperta*; Eaton, 1961: this latter specimen with perigynia *nerved* on inner face!) Frequent.
70. **C. seorsa** Howe. — Bogs, swamps, wet woods. (F. W. Hennewell, 1915; Eaton, 1961.) Rare.

§16. OVALES Kunth

Key: Man. p.318

72. **C. scoparia** Schkuhr. — Moist to dry open ground, thickets, and open woods. (Hoar, 9 July). Very common.
 —— **forma condensa** (Fern.) Kükenth. (Eaton, 1961.) Infrequent.
 —— **forma moniliformis** (Tuckerm.) Kükenth. (Perkins, 1880.) Infrequent.
73. **C. tribuloides** Wahlenb. — Swamps, meadows, low woods. (Deane, 1887.) Rather common.
74. **C. projecta** Mackenz. — Moist to wet woods, shaded stream banks. (Eaton, 1959.) Uncommon. This and the preceding species can reproduce vegetatively. See Rh. 61: 294 (1959).
79. **C. normalis** Mackenz. — Damp or dry open woods and fields. (Eaton, 1943.) Not common. (Frequent.)
80. **C. tenera** Dew. — Moist to dry fields, shaded wood-roads. (Eaton, 1932.) Common.
83. **C. Longii** Mackenz. — Wet or damp, peaty or shady soils. (Eaton, 1930.) Rare. (Frequent nearer the coast.)
84. **C. cumulata** (Bailey) Mackenz. — Dry to boggy acid soils, mostly open ground. (Thoreau, 1859.) Rare. (Uncommon.)

86. *C. brevior* (Dewey) Mackenz. — Dry open ground. (Thoreau, n.d.) Common.
87. *C. molesta* Mackenz. — Dry to moist open fields, borders of woods. (Eaton, 1934.) Very rare. Two collections from New England; Concord the most northeasterly known locality.
92. *C. alata* T. & G. — Wet meadows, swamps, and low open woods. (E. Jarvis, 1835: specimen at U. Mass., Amherst; Thoreau, 1859.) Occasional. (Uncommon.)
94. *C. straminea* Willd. — Meadows, swamps. (Eaton, 1932, 1957, 1961.) Uncommon. Northeast limit of range apparently along line of Concord, Bedford and Reading.
102. *C. argyrantha* Tuckerm. — Open woods, clearings. (Jenks and Swan, 1888.) Rare. (Uncommon.)

Subgenus II. EUCAREX Coss. & Germ.

§17. POLYTRICHOIDEAE Tuckerm.

A single species.

104. *C. leptalea* Wahlenb. — Wet woods, meadows, swamps. (Thoreau, 1859.) Rare. (Uncommon.)

§27. MONTANAE Fries

Key: Man. p.332

117. *C. pensylvanica* Lam. — Open, dry, often sterile soil or dry open woods. (Thoreau, 1858.) Very common.
— *forma gracilifolia* (Peck) Kükenth. — Mostly dry open woods. (Eaton, 1936.) Common.
120. *C. Emmonsii* Dew. — Dry woods, shady banks, thickets. (Thoreau, 1859.) Uncommon. (Uncommon, but general.)
123. *C. novae-angliae* Schwein. — Woods, chiefly moist. (Eaton, 1956.) Rare. (Occasional.) The identity of the Concord plant has been questioned.
127. *C. umbellata* Schkuhr. — Rocky woods, or dry sandy soil. (Thoreau, n.d.) Uncommon. (Frequent.)

§32. CRYPTOCARPAE Tuckerm.

Key: Man. p.338

142. *C. crinita* Lam. var. *crinita*. — Wet meadows, wooded swamps. (Hoar, 1858.) Common.
— var. *gynandra* (Schwein.) Schwein. & Torr. Similar habitats. (Eaton, 1932.) Common.

§33. ACUTAE Fries

Key: Man. p.340

146. *C. nigra* (L.) Reichard. — Swamps, peaty turf, wet meadows. (Thoreau, 1859.) Uncommon. (Frequent.)
148. *C. stricta* Lam. var. *stricta*. — Swamps, meadows, wet woods. (Hoar, 1858.) Very common. Forms hard stools in standing water.
- var. *strictior* (Dew.) Carey incl. forma *curtissima* (Peck) Kükenth. (Hoar, 11 June: a fragmentary specimen; Eaton, 1961: two stations.) Occasional, seldom collected.
150. *C. Haydenii* Dew. — Swamps and meadows. (Hoar, n.d.; Eaton, 1932.) Occasional.
- C. Haydenii* × *nigra*. — Wet meadow, where putative parents present. (Eaton, 1932.) A putative hybrid, hence questionable.

§34. ATRATAE Kunth

A single species with us.

156. *C. Buxbaumii* Wahlenb. — Wet meadows, swamps, shores. (Hoar, 1858; Eaton, 1932.) Uncommon. (Occasional.)

§38. ANOMALAE Carey

A single species with us.

165. *C. scabrata* Schwein. — Wet woods, glades and meadows. (Thoreau, 1859; Hoar, 21 July.) Uncommon. (Frequent.)

§39. HIRTAE Tuckerm.

Key: Man. p.348

168. *C. lasiocarpa* Ehrh. var. *americana* Fern. — Swamps, wet meadows, bogs. (E. Jarvis, 1835, specimen at U. Mass., Amherst; Hoar, 21 June.) Frequent.
169. *C. lanuginosa* Michx. — Wet meadows, swamps, shores. (Thoreau, 1859.) Common.
170. *C. vestita* Willd. — Dry, sandy or gravelly deciduous woods. (Hoar, 12 June.) Common.

§40. VIRESCENTES Kunth

Key: Man. p.350

172. *C. pallescens* L. var. *neogaea* Fern. — Grasslands, meadows, glades. (Hoar, 12 June.) Common.
174. *C. hirsutella* Mackenz. — Open woods, clearings, and fields. (Eaton, 1957.) Very rare.

178. *C. virescens* Muhl. — Dry woods and thickets. (Eaton, 1959.) Frequent.

179. *C. Swanii* (Fern.) Mackenz. — Woods, thickets, clearings. (Hoar, 12 July.) Common.

§42. GRACILLIMAE Carey

Key: Man. p.352

182. *C. gracillima* Schwein. — Dry or moist woods, meadows. (Hoar, 11 June.) Rather common.

§43. SYLVATICAЕ Boott

A single species with us.

190. *C. debilis* Michx. var. *Rudgei* Bailey. Woods, openings, moist fields. (Thoreau, 1859.) Very common.

§47. OLIGOCARPAЕ Carey

Key: Man. p.357

199. *C. conoidea* Schkuhr. — Meadows, grassy swales. (Hoar, 15 June.) Uncommon. (Frequent.)

§48. PANICEAE Tuckerm.

Key: Man. p.360

206. *C. PANICEA* L. — Meadows and grasslands. (Thoreau, 1850.) Infrequent. (More frequent near coast.) Naturalized from Europe.

§49. LAXIFLORAE Kunth

Key: Man. p.362

216. *C. digitalis* Willd. Dry to moist, usually rich deciduous woods and glades. (Eaton, 1932, 1957, 1960.) Uncommon. (Frequent.)

217. *C. laxiculmis* Schwein. — Rich woods, and glades. Thoreau, 1859; Eaton, #5143, 1961.) Occasional.

219. *C. laxiflora* Lam. — Rich dry woods and shady banks. (Eaton, 1932.) Uncommon. (Uncommon but general.)

221. *C. blanda* Dew. — Rich woods. (Hoar, 1858; Eaton, 1932, from same station.) Uncommon.

§50. EXTENSAЕ Fries

Key: Man. p.368

229. *C. flava* L. var. *fertilis* Peck. — Meadows, shores, low open ground. (Deane, 1886.) Uncommon. (Uncommon but general.)

§53. PALUDOSAE Fries

Key: Man. p.371

A single species with us.

240. *C. lacustris* Willd. — Circumneutral meadows and swamps.
(Hoar, 17 June.) Rare. (Occasional.)

§54. PSEUDO-CYPERAE Tuckerm.

Key: Man. p.373

247. *C. comosa* Boott. — Meadows and swamps. (Thoreau, 1859.) Common.
249. *C. lurida* Wahlenb. — Meadows, swamps, wet woods. (Thoreau, 1859.) Very common. (One of the commonest species in North America.)

§56. FOLLICULATAE Mackenz.

A single species with us.

254. *C. folliculata* L. — Peaty meadows and swampy woods.
(Hoar, 12 July.) Common.

§57. LUPULINAE Tuckerm.

Key: Man. p.376

256. *C. intumescens* Rudge. — Moist open woods and meadows, swales. (Thoreau, 20 June.) Common.
258. *C. lupulina* Michx. var. *lupulina*. Swamps and wet woods. (Thoreau, 1859.) Frequent. (Common.) [Thor.]

§58. VESICARIAE Tuckerm.

Key: Man. p.378

262. *C. rostrata* Stokes var. *rostrata*. — Wet meadows, swamps, shores. (Thoreau, 1859.) Common.
— var. *utriculata* (Boott) Bailey. — Similar habitats. (Thoreau, 1859.) Frequent.
264. *C. oligosperma* Michx. — Peat bogs, acid swamps. (Hoar, 20 June; Deane, 1886.) Rare. (Local: from two other towns in Middl.)
265. *C. bullata* Schkuhr. — Wet meadows, bogs, acid swamps. (Hoar, 10 June.) Common.
266. *C. vesicaria* L. var. *vesicaria*. — Wet meadows, swales, shores. (Thoreau, 1859.) Rather common.
— var. *monile* (Tuckerm.) Fern. (Thoreau, 1859.) Common.
— var. *jejuna* Fern. (Eaton, 1961.) Uncommon.

Family 24. ARACEAE (ARUM FAMILY)

Key: Man. p.382

1. ARISAEMA Mart. Indian Turnip

Key: Man. p.382

1. **A. atrorubens** (Ait.) Blume, Jack-in-the-Pulpit. — Low, often wet woods and thickets. (Eaton, 1955.) Common. [Thor.]
3. **A. Stewardsonii** Britt., Jack-in-the-Pulpit. — Similar habitats. (Eaton, 1958.) Infrequent. (Frequent.)

2. PELTANDRA Raf. Arrow-Arum

1. **P. virginica** (L.) Kunth, Arrow-Arum. — Shallow water along slow streams, swamps. (Hoar, 1857.) Common. [Thor.] Includes several named forms, based on leaf-outline. (Key to forms: Man. p.383.)

3. CALLA L. Water-Arum, Calla

1. **C. palustris** L., Wild Calla. — Shallow muddy pools, bogs, quagmires. (Hosmer, n.d.; Eaton, 1955.) Rare: a single known surviving station northeast of Bateman's Pond. See Th. J. 9: 411, but no specimen in Thor. Herb! (Scattered stations, especially west of Concord; locally abundant in Lexington until 1968, station since destroyed by land-fill.)

4. SYMPLOCARPUS Salisb. Skunk-cabbage

1. **S. foetidus** (L.) Nutt. — Low, wet or swampy woods; meadows. (Eaton, 1956.) Very common. [Thor.]

6. ACORUS L. Sweetflag, Calamus

1. **A. Calamus** L. — Shallow water, bordering slow streams, wet meadows. (Eaton, 1922.) Formerly common, now apparently very scarce owing perhaps to river pollution. (Frequent.) [Thor.]

Family 25. LEMNACEAE (DUCKWEED FAMILY)

Key: Man. p.385

1. SPIRODELA Schleid.

1. **S. polyrhiza** (L.) Schleid., Water-flaxseed. — Floating on pools, and stream and pond margins. (Deane, 1886.) Locally common along river, especially on Great Meadows impoundments, sparingly elsewhere. (Frequent.)

2. LEMNA L. Duckweed

Key: Man. p.386

1. *L. trisulca* L., Star Duckweed. — Floating *beneath* surface of still, shallow water. (Eaton, 1946.) Apparently rare.
4. *L. minor* L., Duckweed. — Floating on quiet waters. (Hosmer, n.d.) Sparsely common in our normally acidulous waters; an abundant weed in midstream on the river in summer since the mid-1930's, a phenomenon attributed to massive pollution from sewage. See Rh. 49: 165–171. Pratt (15) apparently considered this species sufficiently uncommon and perhaps rare to have noted: "A small floating plant covering the stagnant pools at the side of the road below Sleepy Hollow and along the brook below." Thoreau's specimen lacks collecting data except the date: "June '55." There is no surviving collection by Hoar. It may well be that the most abundant plant in Concord — to be counted by billions of individuals — was indeed rare 100 years ago. [Thor.]

3. WOLFFIA Horkel Water-meal

Key: Man. p.386

1. *W. columbiana* Karst. — Floating just beneath surface of quiet waters. (Eaton, 1938.) Very rare when first discovered. Previously unknown in Massachusetts except for a single collection at Holyoke; now abundant in the Sudbury-Concord river drainage system and rapidly spreading throughout southern New England. See Rh. 41: 42–43.
2. *W. punctata* Griseb. — Floating *on* the surface of quiet waters. (Eaton, 1957.) Very rare when first discovered; previously unknown from New England; now usually but sparsely associated with No. 1 wherever the latter occurs. See Rh. 60: 318 (1958).

Family 26. XYRIDACEAE (YELLOW-EYED GRASS FAMILY)

A single genus with us.

1. *XYRIS* L. Yellow-eyed Grass
2. *X. torta* Smith. — Damp, peaty or siliceous soils, often pond and brook margins. (Eaton, 1922.) Infrequent, but general in Middl. [Thor.]
6. *X. caroliniana* Walt. — Similar habitats. (Hosmer, n.d.) Infrequent. (Not uncommon.)

Family 27. ERIOCAULACEAE (PIPEWORT FAMILY)

A single genus and species with us.

1. ERIOCAULON L. Pipewort

3. *E. septangulare* With., Pipewort.—Shallow water of ponds, river meadows; when exsiccated, plants with nearly sessile heads. (Eaton, 1920.) Common. [Thor.]

Family 29. COMMELINACEAE (SPIDERWORT FAMILY)

Key: Man. p.392

1. COMMELINA L. Dayflower

1. *C. communis* L. var. *COMMUNIS*, Dayflower.—Waste ground, dooryards, ditches, etc. (Eaton, 1957.) Infrequent, except as garden weed, when often abundant. Naturalized from Asia.

— var. *LUDENS* (Miquel) C. B. Clarke.—Similar habitats. (Eaton, 1965.) Very rare. A single record from New England. Naturalized from Asia.

3. TRADESCANTIA L. Spiderwort

Key: Man. p.394

4. *T. virginiana* L.—Roadsides, moist banks, meadows, etc. (Eaton, 1958.) Occasional. Escaped from cultivation. Introduced from farther south and west.

Family 30. PONTEDERIACEAE (PICKERELWEED FAMILY)

A single genus and species with us.

2. PONTEDERIA L. Pickerelweed

1. *P. cordata* L., Pickerelweed.—Shallow water, muddy shores. (Eaton, 1957.) Very common. [Thor.]

Family 31. JUNCACEAE (RUSH FAMILY)

Key: Man. p.397

1. JUNCUS L. Rush

A difficult genus for inexperienced students. Seed characters not always visible with hand lens. For useful supplementary key, consult Seymour: Fl. N. E.

1. *J. bufonius* L.—Damp or exsiccated open ground, roadsides, cultivated soils. (Thoreau, 3 July.) Common, often weedy.
5. *J. secundus* Beauv.—Dry, sandy or gravelly soils, rock pockets. (Eaton, 1957.) Infrequent.
7. *J. tenuis* Willd. var. *tenuis*.—Damp, wet or dry open soils,

- roadsides, paths, etc. (Thoreau, 1858.) Very common.
- var. *Williamsii* Fern. (Eaton, 1928.) Infrequent.
(Frequent.)
8. *J. platyphyllus* (Wieg.) Fern.— Dry or moist, usually sandy soil. (Thoreau, 1860.) Uncommon.
14. *J. Greenei* Oakes & Tuckerm.— Dry to moist siliceous open soils. (Thoreau, 1859.) Occasional. (Rather common.)
20. *J. effusus* L. var. *decipiens* Buchenau.— Low, marshy ground, wet pastures, etc. (Eaton, 1957.) Occasional.
- var. *costulatus* Fern.— Similar habitats. (Eaton, 1956.) Frequent.
- var. *solutus* Fern. & Wieg. (Deane, 1886.) Common.
21. *J. balticus* Willd. var. *littoralis* Engelm.— Sandy shores, peaty meadows. (Thoreau, 1850.) Infrequent. (Frequent.)
28. *J. marginatus* Rostk.— Moist, sandy pond margins, peaty soils, etc. (Thoreau, 1858.) Rather common.
31. *J. nodosus* L.— Pond and river margins, swamps, wet pastures. (H. Mann, Jr., 1862.) Rare. (Uncommon.)
39. *J. canadensis* J. Gay.— Pond and river shores, meadows, moist sands and peats. (Thoreau, 1858.) Common.
- forma *conglobatus* Fern. (H. Mann, Jr., n.d.) Occasional.
41. *J. brevicaudatus* (Engelm.) Fern.— Shores, muddy and wet places. (Hoar, 1858; Thoreau, 1860.) Common.
43. *J. acuminatus* Michx.— River meadows. (Hoar, 1890.) Locally common. (Infrequent.)
49. *J. militaris* Bigel.— Riverbanks and shallow water. (Deane, 1886.) Uncommon.
- forma *subnudus* Fern. (Deane, 1886.) Occasional.
52. *J. articulatus* L. var. *obtusatus* Engelm.— Wet soil, shores, meadows. (Thoreau, 1860.) Apparently very scarce.
54. *J. pelocarpus* Mey.— Pond shores, wet sands, peaty marshes, ditches. (Thoreau, 1858.) Common.

2. LUZULA DC. Woodrush

Key: Man. p.416

Apparently a single species with us.

8. *L. multiflora* (Retz.) Lej.— Fields, meadows, open woods. (Thoreau, 1859.) Common.

Family 32. LILIACEAE (LILY FAMILY)

Key: Man. p.420; also Seymour, p.180

10. VERATRUM L. False Hellebore

A single species with us.

1. *V. viride* Ait., White Hellebore.—Wet woods and swamps, wet open peats. (Eaton, 1958.) Common. [Thor.]

11. UVULARIA L. Wild-oats, Bellwort

Key: Man. p.429

1. *U. perfoliata* L.—Rich, usually thin dry woods. (Hoar, 1857; Eaton, 1960.) Rare. Hoar's station not rediscovered. Station on Annursnack Hill discovered by R. and E. Corey. (Occasional.) [Thor., Sophia E., fide Thor.: see Introduction, p. 33.]
4. *U. sessilifolia* (L.), Wild-oats.—Woods, clearings, moist fields. (Eaton, 1922.) Common, often abundant in large patches. [Thor.]

COLCHICUM L.

Description: Man. p.429

- C. *AUTUMNALE* L., Wild Crocus.—Moist fields and meadows. (Fernald, 1910.) Rare, perhaps ephemeral. Known in New England from this single collection. Introduced from Europe. Escaped from cultivation.

12. ALLIUM L. Onion, Garlic, Leek

Key: Man. p.430

1. *A. canadense* L., Wild Garlic.—Low woods, meadows. (Hoar, 1887.) Frequent.

14. HEMEROCALLIS L. Day Lily

1. *H. FULVA* L., Orange Day Lily.—Roadsides, waste places, old houselots. (Eaton, 1958.) Frequent, often locally abundant. [Thor.] Introduced and naturalized from Eurasia.

16. LILIUM L. Lily

Key: Man. p.433

1. *L. philadelphicum* L., Wood-Lily.—Dry, open, usually deciduous woods and clearings. (Eaton, 1920.) Frequent, but scarce. [Thor.]
5. *L. canadense* L., Nodding Lily, Canada Lily.—Meadows, low open woods and thickets. (Eaton, 1922.) Common. [Thor.]
9. *L. TIGRINUM* L., Tiger-Lily.—Roadsides, old house-sites,

etc. (Eaton, 1958.) Occasional escape from cultivation.
Introduced and naturalized from eastern Asia.

19. **ORNITHOGALUM** L. Star-of-Bethlehem

1. **O. UMBELLATUM** L.—Meadows, grasslands, roadsides. (Eaton, 1958.) Infrequent, but locally abundant, often weedy. Introduced and naturalized from Europe.

22. **ASPARAGUS** L. Asparagus

1. **A. OFFICINALIS** L., Garden Asparagus.—Sandy fields, orchards, roadsides. (Hoar, 1858.) Common escape from cultivation as single plants, apparently spread by birds. Introduced from Europe.

23. **CLINTONIA** Raf.

A single species with us.

1. **C. borealis** (Ait.) Raf.—Low woods and shaded banks. (Sophia E. Thoreau, "Sleepy Hollow," n.d.; Eaton, 1921.) Frequent, often in large patches. [Thor.]

24. **SMILACINA** Desf. False Solomon's-seal

Key: Man. p.439

1. **S. racemosa** (L.) Desf. var. **racemosa**, False Solomon's-seal, False Spikenard.—Open woods, shady rocky roadsides, in moist or dry soil. (H. Mann, Jr., 1862.) Very scarce. (Common northward.)

— var. **cylindrata** Fern. (Thoreau, "Concord," n.d.; Eaton, 1929, fruiting; 1930, in flower.) Common. It is more southern than var. *racemosa*, reaching southern New Hampshire for its northern limit in New England.

25. **MAIANTHEMUM** Weber

A single species in the Manual range.

1. **M. canadense** Desf., False Lily-of-the-Valley, Two-leaved Solomon's-seal.—Pine or deciduous woods, shady banks. (H. Mann, Jr., 1802.) Very common, often forming extensive mats. [Thor.]

28. **POLYGONATUM** Mill. True Solomon's-seal

Key: Man. p.442

1. **P. pubescens** (Willd.) Pursh.—Open rock woods and roadsides, shaded niches in outcroppings. (Eaton, 1958.) Rather common, occasionally abundant. [Thor.]
4. **P. CANALICULATUM** (Muhl.) Pursh, Great Solomon's-seal.—Rich woods and shaded alluvium. (Hosmer, n.d.) In-

troduced from farther west. Location of Concord station unknown.

29. CONVALLARIA L. Lily-of-the-Valley

1. C. MAJALIS L.—Open woods, roadsides, cemeteries, etc. (Hosmer, n.d.; Eaton, 1957.) Occasional; generally abundant where it occurs. Escaped from cultivation. Introduced and naturalized from Europe.

30. MEDEOLA L. Indian Cucumber-root

A single species in the Manual range.

1. M. virginiana L.—Low woods, usually in leaf-mold or deep humus. (H. Mann, Jr., 1862.) Widely distributed, rather common. Sterile plants simulate those of the uncommon orchid, Whorled Pogonia, *Isotria verticillata*. [Thor.]

31. TRILLIUM L. Wakerobin, Birthroot

Key: Man. p.443

6. T. cernuum L., Nodding Trillium.—With us usually in rich, damp circumneutral soils of open woods, near brooks. (Eaton, 1922.) Uncommon. (Widely distributed.) [Thor.]

12. T. undulatum Willd., Painted Trillium.—Acid to subacid moist woods, usually in deep humus. (S. E. Thoreau, n.c.d., but collected in Concord fide Thoreau. See Introduction, p. 32; reported by Pratt (15), who wrote: "Rare. Have found it only in a small grove near Fitchburg R.R."; Hoyle, 1901.) Rare, or perhaps extirpated. (Uncommon to frequent west and northwest of Concord; formerly abundant locally in Acton.)

33. SMILAX L. Catbrier, Greenbrier

Key: Man. p.447

3. S. herbacea L., Carrion-flower.—Rich or alluvial thickets; meadows, damp open woods. (Hoar, 1858.) Frequent, but somewhat sporadic. [Thor.]

7. S. rotundifolia L.—Low, moist or dry thickets and open woods. (H. Mann, Jr., n.d., probably 1802.) Common, especially near the rivers; often forming impenetrable entanglements. [Thor.]

10. S. glauca Walt. var. leurophylla Blake, Sawbrier.—Dry to moist sandy thickets, open woods. There is a specimen in the Thoreau Herbarium annotated "June 1885," but there is no mention of the plant in the Journal for

that month. However, since this species has been collected in Weston and Waltham, and since Thoreau apparently was in Concord throughout the month, it is accepted as found in Concord. Rare.

Family 35. AMARYLLIDACEAE (AMARYLLIS FAMILY)

A single native species with us.

7. HYPOXIS L.

1. **H. hirsuta** (L.) Coville, Yellow Stargrass. — Open woods, clearings, meadows, in dry or moist soil. (Hoar, 1867.) Common. [Thor.]

Family 36. IRIDACEAE (IRIS FAMILY)

Key: Man. p.456

3. SISYRINCHIUM L. Blue-eyed Grass

Key: Man. p.457

6. **S. montanum** Greene var. **crebrum** Fern. — Mostly damp open soil, meadows, shores, margin of woods. (Eaton, 1958.) Common, often abundant.
8. **S. angustifolium** Mill. — Similar habitats. (Eaton, 1957.) Frequent. The old name, *S. Bermudiana* L., has recently been revived. See Rh. 59: 159 (1957).
9. **S. atlanticum** Bickn. — Similar habitats. (Hoar, 1858.) Common, often abundant.

4. IRIS L. Iris, Fleur-de-lis

Key: Man. p.459

1. **I. prismatica** Pursh, Slender Blue Flag. — Peats, sands, shores, marshes. (Frohock, 1880; Eaton, 1920.) Becoming rare, formerly occasional in suitable brook meadows. (Frequent to common near the coast.) Concord apparently at northwestern limit of range in New England.
5. **I. versicolor** L., Blue Flag. — Meadows, swamps, brook margins, etc. (Hoar, 1858.) Common. [Thor.]
7. **I. PSEUDACORUS** L., Yellow Iris. — River and pond banks, meadows, wet wasteland. (Brewster, 1898.) Sporadic. Local populations generally eradicated by summer flooding of river, only to become re-established in intervening years. (Locally abundant, but sporadic.) Naturalized from Europe.

Family 39. ORCHIDACEAE (ORCHIS FAMILY)

Key: Man. p.463

1. **CYPRIPEDIUM** L. Lady's-slipper, Moccasin-flower
Key: Man. p.466
5. **C. acaule** Ait., Common Lady's-slipper.—Dry to moist acid soil in oak or pine woods. (Eaton, 1921). Common. [Thor.]
 3. **HABENARIA** Willd. Fringed Orchis

Key: Man. p.469

In the Orchidaceae the lip is an extremely important diagnostic character. It should be examined preferably when fresh, with adequate magnification. When preparing specimens for the press, students are advised to lay a flower between *waxed papers* so as to display the lip and other floral parts in their entirety without their sticking to the pressing paper.

3. **H. clavellata** (Michx.) Spreng. including var. **ophioglossoides** Fern.—Mossy or wet sandy woods, springheads, and pond shores. (Hoar, 1857.) Perhaps rare. (Occasional, more frequent westward.) [Thor.]
4. **H. flava** (L.) R. Br. var. **herbiola** (R. Br.) Ames & Correll.—Springy meadows, wet shores. (Perkins, 1880; Frohock, 1880.) Uncommon. (Occasional.) [Thor.]
9. **H. dilatata** (Pursh) Hook.—Springy meadows, bogs, shores. (Jarvis, n.d. but ca. 1835. Specimen at U. Mass. and annotated: "Found in meadow before Edmund Hosmer's"; identification confirmed by C. Schweinfurth.) Rare. Also Sudbury (Hosmer) and Sandwich (Svenson) in eastern Massachusetts.
12. **H. orbiculata** (Pursh) Torr.—Dry to moist woods. (Hosmer, n.d.) Rare. (Known otherwise in Middl. from Reading and Sherborn.) Pratt (15) wrote of this species: "Rare. Have found but three plants native to Concord, but had previously introduced it from Wachusett. Two of the natives are on Ponkatassee [hill], and one in the north part of town." [Thor., 1857.]
17. **H. blephariglottis** (Willd.) Hook., White Fringed Orchis.—Sphagnum bogs, wet peaty meadows and mossy low woods. (H. Mann, Jr., 1862.) Rare, perhaps extirpated. (Occasional). [Thor., n.d., but see Th. J. 6: 345; 6: 408; 11: 83. He found this species at three different stations in Concord, abundantly at Ledum Bog, where now apparently extirpated.]

18. **H. lacera** (Michx.) Lodd. — Acid soils in dry to wet fields, meadows, etc. (Hoar, 1858.) Sporadically common and widely distributed. [Thor., 1857.]
20. **H. psycodes** (L.) Spreng., Small Purple Fringed Orchis.— Swampy open woods, meadows, shores, etc. (Eaton, 1930.) Uncommon, perhaps rare. Pratt commented: "Common in moist meadows." (Frequent, well distributed.) [Thor.]
21. **H. fimbriata** (Ait.) R. Br., Large Purple Fringed Orchis. — Along brooks in rich woods, swampy woods, meadows. (H. Mann, Jr., 1862.) Occasional; less uncommon in Concord than No. 20 of which it is considered a variety (var. *grandiflora* (Bigelow) Gray) by many orchidologists. [Thor.]

4. POGONIA Juss.

1. **P. ophioglossoides** (L.) Kern., Rose Pogonia. — Sphagnous meadows, shores and bogs. (Hoar, 1878.) Formerly locally abundant in sphagnous peats in our river meadows. (Formerly common throughout, but habitats gradually being destroyed.) [Thor.]

6. ISOTRIA Raf.

1. **I. verticillata** (Willd.) Raf., Whorled Pogonia. — Acid to sub-acid woods. (Eaton, 1961.) Rare. (Local; known from five stations in Middl., where frequently in abundant colonies.) Found in Concord by S. E. Thoreau fide H. D. Thoreau but no specimen survives. Mrs. Elma P. Logermann discovered the station in pine woods near the Kalmia Swamp at Conantum from which the Eaton specimen was collected. Whether it was the same as Miss Thoreau's station is in doubt. Perhaps her brother misunderstood her report, thus explaining the curious annotation on the Thoreau specimen of *Panicum latifolium* (*q.v.*). Certainly, a field is a curious habitat for "Whorled Pogonia" (currently known as *Isotria*), but a reasonable habitat for Whorled Polygala (*P. verticillata*). See Introduction, p. 32. Sterile plants resemble *Medeola* (Indian Cucumber).

8. CALOPOGON R. Br. Grass-pink

1. **C. pulchellus** (Salisb.) R. Br. — Sphagnum bogs, peaty meadows, wet shores. (H. Mann, Jr., 1862). Uncom-

mon. Several localities, some destroyed. (Generally distributed, now decreasing.)

9. ARETHUSA L. Arethusa

1. A. **bulbosa** L.—Sphagnous or peaty meadows, bogs. (H. Mann, Jr., 1862; Eaton, 1921.) Formerly locally abundant; now very rare, perhaps extirpated. Pratt considered it “abundant in mossy swamps in all quarters of the town.” (Formerly widely distributed, now scarce.) [Thor.]

10. EPIPACTIS Sw. Helleborine

1. E. **HELLEBORINE** (L.) Crantz.—Open woods, shady alluvial thickets, near settled areas. (Eaton, #5957, 1966; #5959, 1966.) Rare. No. 5957 collected as one of numerous albino plants mingled with perhaps fifty others of normal color, as weeds among shrubs on edge of wooded riverbank; No. 5959 collected as a portion of the inflorescence from a single plant appearing on edge of dry oak woods near a rock garden about three miles distant from site of No. 5957. Both were discovered in 1966 by experienced and observant gardeners. Known also in eastern Massachusetts from Boxford (Essex Co.), Newton (Middl.), and Woods Hole (Barnstable Co.). Adventive from Europe; first recorded in the New World from Rochester, New York, ca. 1879. To judge from NEBC specimens, its spread eastward was slow, the first New England collection being from Stockbridge, Berkshire Co., Massachusetts, in 1902, and the second from Woods Hole in 1926. Only two stations were added within the next fifteen years. Specimens from nine more townships were collected from 1940 to 1949; three more towns were added from 1950 to 1959; and an additional fifteen from 1960 to 1969. Thus the plant is being noticed with increasing frequency and is now (1974) spreading throughout the six states, often appearing as if indigenous in places far removed from habitations.

11. SPIRANTHES Richard Ladies'-tresses

Key: Man. p.477

2. S. **lacera** Raf., Northern Slender Ladies'-tresses.—Dry to

- moist fields, peaty meadows. (Hoar, 27 July.) Frequent.
3. **S. gracilis** (Bigel.) Beck, Southern Slender Ladies'-tresses.
— Dry to moist sterile, often sandy open soil. (Hoar, 1857.) Uncommon. Where the range overlaps that of No. 2, as in southern New England, many confusing intergrades occur, prompting some prominent orchidologists to lump this species with *S. lacera*. [Thor.]
 7. **S. cernua** (L.) Richard var. *cernua*, Common Ladies'-tresses. — Wet to dryish fields, shores, sterile open ground. (Hoar, 1879.) Common. [Thor.]
— var. *ochroleuca* (Rydb.) Ames. — Similar habitats. (Eaton, 1930, det. by C. Schweinfurth.) Rare. Five other Massachusetts collections: Carlisle: 1; Bristol Co.: 2; Berkshire Co.: 2.
 12. **GOODYERA R. Br.** Rattlesnake-plantain
Key: Man. p.480
 2. **G. tesselata** Lodd. — Dry to moist woodlands, frequently on northern slopes. (Jenks and Swan, 1890; Hosmer, n.d.) Rare. (Infrequent.)
 4. **G. pubescens** (Willd.) R. Br. — Similar habitats. (Hoar, 1887.) Frequent. [Thor.]
 15. **CORALLORHIZA Chatelain** Coral-root
Key: Man. p.483
 2. **C. maculata** Raf., Spotted Coral-root. — Dry woods. (Hoar, 1879.) Scarce. (Frequent.) [Thor.]
 17. **LIPARIS Richard** Twayblade
For description of the two species: Man. p.485-486
 1. **L. liliifolia** (L.) Richard. — Loamy or sandy woods or rich rocky wooded banks. (Eaton, 1961.) Very rare. (Rare.) For comment, see Endangered Native Species, p. 41.
 2. **L. Loeselii** (L.) Richard, Bog or Yellow Twayblade. — Peaty, mossy thickets, meadows and bogs. (Jarvis, 1835.) Rare. (Infrequent.) Specimen preserved in U. Mass. Identification confirmed by C. Schweinfurth.

CLASS II. DICOTYLEDONEAE, Dicotyledons
Subclass I. ARCHICHLAMYDEAE
(CHORIPETALAE, APETALAE, and POLYPETALAE)

Family 41. SALICACEAE (WILLOW FAMILY)

(Key: Man. p.487

1. SALIX L. Willow, Osier

Key: to sections and species, Synoptic, Man. p.488; to Staminate Material, Artificial, p.493; to Material with Mature Foliage, including Sprouts, p.499. A useful set of artificial keys appears in Fl. Vt., pp. 144-147, which includes all species reported from Middl. with the exception of two introduced species, *viz.*: the uncommon *S. pentandra* L. and the rare *S. viminalis* L. On the preceding pp. 140-143 are excellent photographic illustrations of mature leaves.

1. **S. nigra** Marsh., Black Willow.—Riverbanks, meadows, pond shores. (Hoar, 1858.) Common.
5. **S. lucida** Muhl., Shining Willow.—Similar habitats, low ground. (Hoar, 24 May 1858, ♂; July, in leaf.) Common.
9. **S. ALBA** L. var. **VITELLINA** (L.) Stokes.—Riverbanks, low ground. (Hoar, n.d., ♂; July 1858, in leaf.) Naturalized from Europe and much planted. Formerly a common and conspicuous large tree along the river from Lee's Bridge to Great Meadows, often forming groups or rows of great height and beauty; now largely extirpated by disease.
25. **S. rigida** Muhl. var. **rigida**.—River and brook banks, shores, low thickets. (Hoar, May 1858, ♀; n.d., in leaf.) Common. Often confused with *S. cordata* Michx.; to distinguish see Rh. 48: 33 (1946).
— var. **angustata** (Pursh) Fern.—Similar habitats. (Eaton, 1960.) Uncommon. Perhaps undeserving of formal recognition; resembles No. 40 and easily mistaken for it.
33. **S. Bebbiana** Sarg. var. **Bebbiana**.—Moist to dry thickets, meadows, roadsides. (Hoar, May 1858, ♂, ♀; July, in leaf.) Very common.
36. **S. pedicellaris** Pursh var. **hypoglauca** Fern.—Low acid ground, meadows, bogs. (Hoar, 1858, ♀.) Frequent along the river. (Common.)
— × **S. rigida**. (Hoar, 1858.) See specimens of *S. rigida* × — var. *pedicellaris*. (Hoar, May 1858, ♀; July 1858, in leaf.) This putative hybrid implies presence of latter var. which has not yet been detected in Concord.

38. *S. discolor* Muhl., Large Pussy-Willow. — Similar habitats. (Hoar, April 1858, ♂; July, in leaf.) Common.
39. *S. humilis* Marsh. var. *humilis*. — Dry thickets, sterile ground, open oak scrub. (Hoar, April 1858, ♂; July, in leaf.) Common.
— var. *microphylla* (Andersss.) Fern. — Similar habitats. (Hoar, May 1858, ♀; July, in leaf.) Common.
40. *S. gracilis* Andersss. var. *textoris* Fern. — Meadows, swamps, river thickets. (Hoar, May 1858, ♂, ♀; July, in leaf.) Common.
— × ? (Perhaps Nos. 40 and 41 described as × *S. subservicea* (Andersss.) Schneid., fide G. W. Argus, Jr. (Eaton, 1961.) Scarce.
41. *S. sericea* Marsh. — Riverbanks, low thickets, brook meadows. (St. John, 1913.) Rather common.

2. *POPULUS* L. Poplar, Aspen

Key: Man. p.520

1. *P. tremuloides* Michx., Quaking Aspen. — Dry open woods, recent clearings and burns, fallow fields. (Eaton, 1935.) Common. A weed-tree of short life, important locally as a nurse-tree in natural reforestation.
2. *P. grandidentata* Michx., Large-toothed Aspen. — Similar habitats. (Eaton, 1935.) Common.
5. *P. DELTOIDES* Marsh., Cottonwood. — Woods, river bottoms, etc. (Eaton, #6639, 1970.) Rare. (Uncommon.) Pistillate trees unusual in Middl., hence frequency of spontaneous occurrence much restricted. Introduced from farther west and south.
8. × *P. GILEADENSIS* Rouleau, Balm-of-Gilead. — Roadsides. (Hoar, n.d.) Rare. (Uncommon.) Origin unknown. Probably a hybrid of *P. deltoides* Marsh. and *P. balsamifera*, spreading from cultivation by sprouts and cuttings, according to Fernald.

Family 42. MYRICACEAE (WAX-MYRTLE FAMILY)

Key: Man. p.523

1. *MYRICA* L.

Key: Man. p.523

1. *M. Gale* L. var. *Gale*, Sweet Gale. — Pond margins, sphagnum bogs, shallow water. (Eaton, 1935.) Common.

— var. **subglabra** (Chev.) Fern. — Similar habitats. (Hoar, 1858; April ♂ ♀, May, leafy branches.) Rather common.

2. **M. pensylvanica** Loisel., Bayberry. — Dry or wet sterile soil near the coast. (Eaton, 1932.) Rare, three known stations, two destroyed. (Uncommon.)

2. COMPTONIA L'Hér.

1. **C. peregrina** (L.) Coul., Sweet-fern. — Sterile soil, open oak scrub, gravel banks, etc. (Hoar, 1858; June, staminate and pistillate flowers; July, leaves.) Common, often dominant.

Family 44. JUGLANDACEAE (WALNUT FAMILY)

Key: Man. p.525

1. JUGLANS L. Walnut

1. **J. cinerea** L., Butternut. — Rich soil. (Eaton, 1957.) Local, two known stations. (General but not common.)
2. **J. nigra** L., Black Walnut. — Rich soil; with us, hedge-rows, thickets, shrubberies, etc. (L. E. Richardson, 1970.) Introduced from farther west and south, occasionally escaping from cultivation. Known in Concord as a single colony, ranging in size from seedlings to well-grown trees; originated from three lawn specimens planted about 1850, now destroyed.

2. CARYA Nutt. Hickory

Key: Man. p.526

4. **C. ovata** (Mill.) K. Koch, Shagbark Hickory. — Woods, roadsides, pastures. (Eaton, 1935.) Formerly common, now scarce. (Frequent.)
6. **C. tomentosa** Nutt., Mockernut. — Similar habitats, dry or moist. (Eaton, 1959.) Uncommon; Concord is at or near northern limit of range. (Infrequent, but well distributed in southern half of Middl.)
7. **C. glabra** (Mill.) Sweet, Pignut. — Dry woods, slopes, pastures. (Eaton #5864, 1965.) Uncommon. (Frequent.)
8. **C. ovalis** (Wang.) Sargent var. **ovalis**, False Shagbark, Sweet Pignut. — Woods, pastures, etc., commonly on rich soils. (Hoar, 1857; Eaton #5547, 1962; 1963: showing winter buds, flowers and fruit from same tagged tree.) Frequent. Ranges farther north than No. 7, into southern New Hampshire and Vermont.

— var. *obcordata* (Muhl. & Willd.) Sargent.— Similar habitats. (Eaton #5985, 1966: leaves and winter buds; #6006, fruits. Both from same tagged tree.) Apparently rare in eastern Massachusetts.

Family 45. CORYLACEAE (HAZEL FAMILY)

Key: Man. p.530

1. *CORYLUS* L. Hazelnut, Filbert

1. *C. americana* Walt. var. *americana*.— Thickets, borders of woods, roadsides. (Eaton, 1935.) Common. (Common.)

2. *C. cornuta* Marsh.— Similar habitats. (Eaton, 1935.) Frequent.

2. *OSTRYA* Scop. Hop-Hornbeam

1. *O. virginiana* (Mill.) K. Koch var. *virginiana*.— Woods, mostly rich and dry. (Lund, n.d.) Occasional. (Well distributed but infrequent.)

3. *CARPINUS* L. Ironwood, Hornbeam

1. *C. caroliniana* Walt. var. *virginiana* (Marsh.) Fern., Blue or Water-Beech, Ironwood.— Low or wet woods, stream banks. (Eaton, 1957; 1966.) Uncommon. Pratt (15) considered it rare, having reported it only from "near north-east of Fairhaven Bay," where it still occurs (1974). Now known from three localities.

4. *BETULA* L. Birch

Key: Man. p.532

1. *B. lenta* L., Black Birch.— Dry or moist, mostly rich woods. (Eaton, 1935.) Common in southeast section. (Common.)

2. *B. lutea* Michx. f., Yellow Birch.— Rich woods, with us mostly on cool north-facing slopes. (Eaton, 1935.) Uncommon. (Frequent, becoming common in northwestern Middl.)

3. *B. nigra* L., Red or River Birch.— Borders of streams. (Eaton, 1957.) A small thriving colony naturalized from an introduced specimen in Pritchard's Woods on bank of Sudbury River. (Occasional escape from cultivation.)

4. *B. populifolia* Marsh., Gray Birch.— Dry or wet, sterile or rich soils, especially old fields and roadsides. (Hoar, 1857, 1858.) Abundant throughout. A shortlived weed-tree, valuable as a nurse-tree.

9. **B. papyrifera** Marsh. var. **papyrifera**, Canoe or Paper Birch.—Cool, mostly north-facing wooded slopes or rich woods. (Hoar, 1857.) Infrequent throughout, occasionally abundant as in Town Forest. (Common north and west.)

— var. **cordifolia** Marsh.—Similar habitats. (Eaton, 1957.) Rare. A plentiful colony with strongly cordate leaves, but identity in doubt in the absence of pistillate aments; perhaps should be transferred to Excluded Species (p. 46).

— × **populifolia**. (Eaton, 1957.) This presumed hybrid rare.

5. **ALNUS** B. Ehrh. Alder

Key: Man. p.537

2. **A. rugosa** (Du Roi) Spreng. forma **rugosa**, Speckled Alder.—Swamps, stream borders, low ground. (Hoar, June, July 1857.) Common.

— forma **Emersoniana** Fern.—Similar habitats. (Eaton, 1857.) Frequent.

3. **A. serrulata** (Ait.) Willd., Common Alder.—Similar habitats. (Eaton, 1949.) Frequent.

Family 46. FAGACEAE (BEECH FAMILY)

Key: Man. p.539

1. **FAGUS** L. Beech

Key: Fl. N. E. p.223

1. **F. grandifolia** Ehrh. var. **grandifolia**, Beech.—Dry woods. (Eaton, 1957.) Scarce. (Infrequent, except in north-western portion of Middl.)

2. **CASTANEA** Mill. Chestnut

Key: Man. p.540

1. **C. dentata** (Marsh.) Borkh., Chestnut.—Dry, gravelly, mostly acid soil. (Eaton, 1935.) Still common as sprouts from trees destroyed by the Chestnut-bark disease. Occasional sprouts survive long enough to produce staminate flowers, rarely nuts.

3. **QUERCUS** L. Oak

Key: Man. p.541

1. **Q. alba** L., White Oak.—Dry woods, roadsides, pastures. (Eaton, 1935.) Common.

5. **Q. bicolor** Willd., Swamp White Oak.—Mostly bottom-

- lands, margins of streams and meadows, swamps. (Hoar, 1857.) Common.
8. **Q. prinoides** Willd., Scrub Oak, Dwarf Chestnut-Oak.— Dry sterile woods and gravel plains. (Eaton, 1935.) Common in suitable habitats.
 9. **Q. Prinus** L., Chestnut-Oak.— Dry, often rocky woods. (Wheeler, 1971.) Rare, presently known as a mature tree and several sprouts and saplings from a single station. (Occasional: Common, east side of Sandy Pond, Lincoln.) [Thor.]
 11. **Q. rubra** L., Red Oak.— Mostly dry woods and roadsides. (Eaton, 1935.) Abundant. (Common.)
 13. **Q. coccinea** Muenchh., Scarlet Oak.— Dry woods in light soil, roadsides. (Eaton, 1935.) Frequent.
 17. **Q. velutina** Lam., Black Oak.— Dry woods. (Eaton, 1935.) Common, but much less so than No. 11. Putative hybrids × No. 11 often confusing.
 20. **Q. ilicifolia** Wang., Scrub Oak, Bear Oak.— Dry, sterile scrub woods or sandy-gravelly plains. (Eaton, 1935.) Common. Much commoner than No. 8 in Middl.

Family 47. ULMACEAE (ELM FAMILY)

Key: Man. p.551

1. **ULMUS** L. Elm

1. **U. rubra** Muhl., Slippery or Red Elm.— Rich woods, bluffs and cliffs, often calcareous soils. (Hoar, April/July 1858; Thoreau, Lee's Cliff, n.d.) Rare. A single station, perhaps now extirpated. Last known collection in 1932. (Rare.)
2. **U. PROCERA** Salisb., English Elm.— Low ground, thickets, roadsides. (Eaton, 1970.) Rare escape from cultivation by abundant suckering. (Occasional.) Introduced from Europe.
4. **U. americana** L. *forma americana*, American Elm.— Rich soils, especially along streams. (Eaton, 1935.) Common. (Common.) Large trees extensively destroyed by the so-called Dutch elm disease, a fungus spread by an elm-bark beetle.
— *forma alba* (Ait.) Fern.— Similar habitats. (Williams, 1908.) Occasional.

3. *CELTIS* L. Hackberry

1. *C. occidentalis* L. var. *pumila* (Pursh) Gray, Hackberry.
— Damp to dry slopes, borders of woods. (Hoar, Sept. 1857: "Lee's Hill.") Rare. (Occasional, becoming rare.) Thoreau records on 28 September 1857 discovery of a colony at foot of Lee's Hill, doubtless informing Hoar; a single large tree survives (1974). A sapling was recently discovered near the summit of Annursnack Hill. [Thor.]

Family 48. MORACEAE (MULBERRY FAMILY)

1. *MORUS* L. Mulberry
2. *M. ALBA* L., White Mulberry.—Roadsides, waste ground. (Eaton, 1963.) Rare. (Occasional.) Escaped from cultivation. Naturalized from Europe.

Family 49. CANNABINACEAE (HEMP FAMILY)

1. *CANNABIS* L. Hemp, Marijuana
1. *C. SATIVA* L.—Waste ground, roadsides, railroad ballast. (L. E. Richardson fide R. J. Eaton, 1971.) Rare. A single plant appeared in 1971 after destruction of an abundant colony in 1970. Adventive from Asia.

Family 50. URTICACEAE (NETTLE FAMILY)

Key: Man. p.556

1. *URtica* L. Nettle
2. *U. procera* Muhl.—Roadsides, waste grounds, moist thickets. (Hoar, 1858.) Common.
4. *U. DIOICA* L., Stinging Nettle.—Roadsides, waste ground, barnyards, etc. (Hoar, 1888.) Uncommon. (Infrequent, but general.) Naturalized from Europe.

3. *PILEA* Lindl. Richweed, Clearweed

Key: Man. p.558

1. *P. pumila* (L.) Gray, Clearweed.—Moist or wet shaded ground. (Hoar, 1858.) Uncommon in natural sites; common, often abundant as garden weed.

4. *BOEHMERIA* Jacq. False Nettle

1. *B. cylindrica* (L.) Sw. var. *cylindrica*.—Moist shady ground, wet shores, swamps. (Hoar, 1888.) Frequent. (Common.)

5. PARIETARIA L. Pellitory

1. **P. pensylvanica** Muhl. — Rich rocky woods, usually on calcareous soils, occasionally as weed in waste places. (Eaton, 1857.) Rare. (Only two other recorded stations east of Connecticut River.) See Rh. 60: 316. Concord station originally discovered by Thoreau: see Th. J. 5: 312.

Family 51. SANTALACEAE (SANDALWOOD FAMILY)

1. COMANDRA Nutt. Bastard-Toadflax

1. **C. umbellata** (L.) Nutt. — Dry, sterile, or acid ground. (Hoar, 1858.) Common.

Family 52. LORANTHACEAE (MISTLETOE FAMILY)

2. ARCEUTHOBIUM Bieb.

1. **A. pusillum** Peck, Dwarf Mistletoe. — Dioecious parasite on Pinaceae, with us known only on *Picea mariana*. (Eaton and Griscom, 1930.) Very rare. (Absent.) In Concord, on southeastern limit of range, at a single bog, recently destroyed by owner. In the Journal entry on 12 February 1858, Thoreau noted its debilitating effect on the spruce at this same bog without discovering the cause. For a brief account, see Rh. 33: 92, and 37: 413.

Family 53. ARISTOLOCHIACEAE (BIRTHWORT FAMILY)

1. ASARUM L. Wild Ginger

1. **A. canadense** L. var. **canadense**. — Rich, often calcareous woods and ledges. (F. W. Hunnewell, 1915.) Rare, not seen in recent years. (Occasional.) Possibly introduced, although not recorded by Pratt as one of his introductions. Thoreau's specimen is annotated "Brattleboro."

Family 54. POLYGONACEAE (BUCKWHEAT FAMILY)

Key: Man. p.565

3. RUMEX L. Dock

Key: Man. p.566

10. **R. orbiculatus** Gray, Water Dock. — Wet meadows, swamps, shores. (Eaton, 1957.) Frequent. (Uncommon.) An indigenous species.

11. R. CRISPUS L., Yellow Dock.—Cultivated land, waste ground. (Hoar, 1889.) Common. Weed. Naturalized from Europe.
14. R. OBTUSIFOLIUS L., Blunt-leaved Dock, Bitter Dock. (Williams, 1898.) Common. Naturalized from Europe.
17. R. ACETOSELLA L., Sorrel, Sheep Sorrel.—Moist to dry sour soil. (Hoar, 1858.) Ubiquitous weed. Naturalized from Europe.

5. POLYGONUM L. Knotweed, Smartweed

Key: Man. p.572. For supplementary key for New England species, see Fl. N. E. p.236.

8. P. ramosissimum Michx. forma ramosissimum, Bushy Knotweed.—Sandy and light soils, roadsides. (Eaton #6058, 1967.) Rare.
12. P. AVICULARE L. var. AVICULARE, Knotweed.—Disturbed, sterile soils, starved lawns, sidewalks, gardens, etc. (Eaton, 1957.) Ubiquitous weed throughout. Very variable; see footnote in Gray's Manual, page 579. Naturalized from Europe.
— var. VEGETUM Ledeb.—Similar habitats. (Hoar, 1857.) Common. Naturalized from Europe.
13. P. tenué Michx.—Dry, open soil. (Hoar, 1858.) Uncommon. (Occasional.)
18. P. amphibium L. var. stipulaceum (Coleman) Fern. forma fluitans (Eat.) Fern.—Fully aquatic in streams. (Eaton, 1929.) Occasionally abundant. (Frequent.)
19. P. coccineum Muhl. forma coccineum.—Riverbanks, pond shores, meadow sloughs. (H. S. Richardson, 1886.) Frequent. (Infrequent.)
— forma natans (Wieg.) Stanford.—Aquatic, leaves floating. (Eaton, 1920.) Rare. (Occasional.)
22. P. pensylvanicum L. var. laevigatum Fern., Pinkweed.—Meadows, shores, waste and cultivated ground. (Hoar, 1858.) A common and abundant weed.
23. P. lapathifolium L. var. lapathifolium.—Similar habitats. (Hoar, 1858.) Common, often weedy.
24. P. SCABRUM Moench.—Ditches, wet places, cultivated ground. (Eaton, 1957.) Apparently rare. Naturalized from Europe.
25. P. ORIENTALE L., Princess-feather.—Waste places, rich soils. (Eaton, 1957.) Rare. (Occasional.) Escaped from cultivation.

26. *P. Careyi* Olney. — Meadows, roadsides, low clearings, cultivated ground. (Hoar, 1858.) Frequent.
27. *P. Hydropiper* L., Common Smartweed. — Damp soils, weedy places in cultivated ground, etc. (Hoar, 1858.) Common.
31. *P. PERSICARIA* L., Lady's Thumb. — Damp clearings, cultivated ground, waste places, etc. (Hoar, 1857.) An ubiquitous weed. Naturalized from Europe.
33. *P. punctatum* Ell. var. *punctatum*, Water-Smartweed. — Meadows, shores, ditches, bogs. (Eaton, 1928.) Common.
— var. *leptostachyum* (Meisn.) Small. — Similar habitats. (Eaton, 1957.) Rare. (Not reported elsewhere from Middl.) Known from a single station.
34. *P. robustius* (Small) Fern. — Pond shores, banks of streams, wet places. (Williams, 1902.) Uncommon.
35. *P. hydropiperoides* Michx. — Shallow water of ponds, streams. (Hoar, 1858.) Rather common.
38. *P. sagittatum* L., Arrow-leaved Tearthumb. — Meadows, bogs, low ground. (Hoar, 1857.) Common.
39. *P. arifolium* L. var. *pubescens* (Keller) Fern., Halberd-leaved Tearthumb. — Meadows, swamps. (Hoar, 1857.) Uncommon. (Frequent.)
41. *P. CONVOLVULUS* L. var. *CONVOLVULUS*, Black Bindweed. — Waste and cultivated ground. (Hoar, 1857.) Common. Naturalized from Europe.
— var. *SUBALATUM* Lej. & Court. — Similar habitats. (Hoar, 1857.) Uncommon. Naturalized from Europe.
42. *P. cristatum* Engelm. & Gray. — Low thicket bordering artificial pond. (Eaton, 1957.) Rare. (Uncommon.) The identification of this specimen has been questioned. See entry on page 45.
43. *P. scandens* L., Climbing False Buckwheat. — Meadows, swamps, damp thickets, pond shores. (Eaton, 1957.) Frequent.
44. *P. cuspidatum* Sieb. & Zucc., Japanese Knotweed. — Roadsides, waste places, neglected cultivated ground. (Hoar, 1890.) Occasional. (Frequent.) An obnoxious plant where established; difficult to eradicate without use of poisons.

6. FAGOPYRUM Mill. Buckwheat

1. F. SAGITTATUM Gilib., Buckwheat.—Waste places, old fields. (Hoar, 1858.) Occasional. Rarely persistent after cultivation. Introduced from Asia.

7. POLYGONELLA Michx. Jointweed

1. P. articulata (L.) Meisn.—Dry sands, gravel road shoulders, cliffs. (Hoar, 1857.) Uncommon. (Formerly infrequent, now rapidly spreading along disturbed roadside gravels.) Thoreau mentions its occurrence at Jenny's Desert where it still persists. (Th. J. 4: 363.)

Family 55. CHENOPODIACEAE (GOOSEFOOT FAMILY)

Key: Man. p.590. A single genus with us.

5. CHENOPODIUM L. Pigweed

4. C. hybridum L. var. gigantospermum (Aellen) Rouleau, (*C. gigantospermum* Aellen), Maple-leaved Pigweed.—Thickets, clearings, neglected fields, waste ground. (Williams, 1908.) Infrequent. (Occasional.)
7. C. Boscianum Moq., (*C. Standleyanum* Aellen).—Roadsides, waste ground, thickets. (Eaton, 1957.) Apparently rare. (Not reported elsewhere in Middl.)
10. C. LANCEOLATUM Muhl., Pigweed.—Waste or cultivated ground. (Eaton, 1962.) Occasional. Naturalized from Europe.
11. C. ALBUM L., Pigweed, Lamb's-quarters.—Mostly as weed in cultivated ground or waste ground. (J. M. Hunnewell, 1908.) Very common. Naturalized from Europe.
12. C. PAGANUM Reichenb., (*C. Bushianum* Aellen), Pigweed.—Similar habitats. (Hoar, 1858.) Occasional. Naturalized from Europe.
16. C. AMBROSIOIDES L., Mexican-Tea.—Waste ground, thickets, cultivated ground. (Eaton, 1957.) Frequent. Naturalized from tropical America.

Family 56. AMARANTHACEAE (AMARANTH FAMILY)

Key: Man. p.601

2. AMARANTHUS L. Amaranth

Key: Man. p.601

4. A. hybridus L., Green Amaranth, Pigweed.—Waste ground, cultivated soils, old fields, etc. (Eaton, 1957.)

Common. An abundant weed, especially in cultivated fields. Semi-cosmopolitan.

5. A. **retroflexus** L., Green Amaranth, Pigweed, Redroot.—Similiar habitats. (Hoar, 1858.) Common. Semi-cosmopolitan weed.

3. ACNIDA L. Water-Hemp

(Habit of *Amaranthus*, and our species placed with it by some authors.)

1. A. **cannabina** L.—Salt marshes and tidal shores. (Williams, 1899.) Rare. Probably not persisting. Known from a freshwater habitat in our area by this single collection. Specimen in GH.
2. A. **ALTISSIMA** Riddell var. **ALTISSIMA**.—Riverbanks, low ground, disturbed soil. (Williams, 1899.) Casual adventive from the Midwest. Not seen in recent years.

Family 57. NYCTAGINACEAE (FOUR-O'CLOCK FAMILY)

A single genus with us.

1. MIRABILIS L. Four-o'clock, Umbrella-wort

Key: Man. p.606

2. M. NYCTAGINEA (Michx.) MacM.—Waste ground, old farmyards, rich soils. (Eaton, 1957.) Rare. (Uncommon.) Adventive from Midwest.
3. M. HIRSUTA (Pursh) MacM.—Open dry or sandy soils. (Eaton, 1932.) Rare. Adventive from the Plains States.

Family 58. PHYTOLACCACEAE (POKEWEED FAMILY)

A single genus with us.

1. PHYTOLACCA L. Pokeweed

1. P. **americana** L., Poke, Pokeweed.—Rich soil, waste ground, roadsides, gardens. (Hoar, 21 Aug.) Common. Often abundantly weedy.

Family 59. AIZOACEAE

Key: Man. p.607

4. MOLLUGO L.

1. M. VERTICILLATA L., Carpetweed.—Cultivated ground, moist, sandy and gravelly places. (Hoar, 1858.) Weedy, often abundant immigrant from tropical America.

Family 60. PORTULACACEAE (PURSLANE FAMILY)

Key: Man. p.608

1. PORTULACA L. Purslane

Key: Man. p.608

1. P. OLERACEA L., Common Purslane, Pusley.—Cultivated and waste ground. (Eaton, 1957.) Common, often abundant. Naturalized from Europe.

3. CLAYTONIA L. Spring-Beauty

1. C. CAROLINIANA Michx., Broad-leaved Spring-Beauty.—Rich open woods. (Hosmer, n.d.) Rare. Doubtless introduced and naturalized; station unknown; otherwise not reported from east of Mt. Watatic in north-central Massachusetts.

Family 61. CARYOPHYLLACEAE (PINK FAMILY)

Key: Man. p.611

1. SCLERANTHUS L.

1. S. ANNUUS L., Knavel.—Dry sandy soil, waste places, road shoulders. (Eaton, 1961.) Abundant at a single station, but probably elsewhere. (Common.) Naturalized from Europe.

2. PARONYCHIA Mill. Whitlow-wort

4. P. canadensis (L.) Wood, Forked Chickweed.—Rich, rocky woods; occasionally a garden weed. (Rodman, 1901, "Our yard"; Eaton, 1959, in a natural habitat.) Rare. (Occasional.) Thoreau, in a journal entry 4 July 1853, mentions "*Anychia dichotoma*, forked chickweed, near the *Parietaria* at Lee's Cliff under the Slippery Elm." (Th. J. 5: 312.)

4. SPERGULARIA J. & C. Presl. Sand Spurrey

1. S. rubra (L.) J. & C. Presl.—Dry sandy sterile soils, gravel sidewalks, etc. (Hosmer, n.d.) Uncommon in natural habitats, occasionally abundant as sidewalk weed. (Frequent.) See Th. J. 4: 277.

5. SPERGULA L. Spurrey

1. S. ARVENSIS L. var. ARVENSIS.—Fallow fields, cultivated ground. (H. Mann, Jr., 1862.) Uncommon. (Frequent.) Naturalized from Europe.

6. SAGINA L. Pearlwort

Key: Man. p.615

2. S. procumbens L., Birdseye.—Shores, damp open soil

(Hosmer, n.d.; Eaton, 1957.) Frequent, occasionally abundant. (Common.)

8. ARENARIA L. Sandwort

Key: Man. p.617

1. A. *lateriflora* L.—Meadows, damp or dry open woods, shores. (Hoar, 1857.) Common.
3. A. *SERPULLIFOLIA* L., Thyme-leaved Sandwort.—Dry sterile soil, fields, roadsides, etc. (H. Mann, Jr., 1862.) Occasional. Naturalized from Europe.

9. STELLARIA L. Chickweed

Key: Man. p.621

1. S. *MEDIA* (L.) Cyrillo, Common Chickweed.—Cultivated ground; damp places about buildings. (Hosmer, n.d.) Abundant. A cosmopolitan weed. Naturalized from Europe.
4. S. *GRAMINEA* L., Common Stitchwort.—Meadows, grasslands. (Hosmer, n.d.) Common. Naturalized from Europe.
13. S. *calycantha* (Ledeb.) Bongard var. *isophylla* Fern.—Meadows, springy places. (Eaton, 1921.) Frequent.

10. CERASTIUM L. Mouse-ear Chickweed

Key: Man. p.624. For an alternative key to New England species of *Cerastium*, see Fl. N.E. p. 258.

4. C. *VULGATUM* L., Common Mouse-ear Chickweed.—Fields, cultivated ground, old lawns, waste places. (Hoar, 1858.) Abundant weed. Naturalized from Eurasia.
6. C. *nutans* Raf.—Moist ledges and rocky outcroppings, rich alluvium, moist sands. (Thoreau, 1856.) Very rare. The only known specimen to have been collected in New England east of the Connecticut River except in Connecticut. It may be seen in the Thor. Herb. and was annotated by Thoreau as from "Island Rock" with the name "*Cerastium nutans*" in his handwriting. Under date of 31 May 1856, Thoreau wrote in his journal: "To Hill [Nashawtuc Hill] and Island" (Egg Rock, where the Sudbury and Assabet rivers meet to form the Concord River) and with a reference to collecting a *Cerastium* there. Despite the lack of collecting data accompanying the specimen, the date of the entry in the journal is considered conclusive evidence of date

and place. Although the pedicels are shorter than typical *C. nutans*, the seeds are (0.4-)0.6(-0.7) mm wide and shallowly papillate in contradistinction to the tuberculate seeds of *C. vulgatum* and *C. arvense*, all three being viewed in the same field under high power. See Th. J. 8: 352 and 8: 366.

12. AGROSTEMMA L. Corn-Cockle

1. A. GITHAGO L., Purple Cockle.—Fallow fields, edges of cultivated ground, waste places. (Eaton, 1957.) Occasional. Naturalized from Europe.

13. LYCHNIS L. Campion

Key: Man. p.629

2. L. DIOICA L., Red Campion.—Waste places, roadsides, etc. (Eaton, 1957.) Infrequent. (Rather common.) Naturalized from Eurasia.
3. L. ALBA Mill., White Cockle or Campion.—Cultivated ground, waste places, roadsides, etc. (Eaton, 1957.) Common. Naturalized from Eurasia.
4. L. CHALCEDONICA L., London-pride, Scarlet Lychnis.—Roadsides, fallow fields near habitations. (Hosmer, n.d.) Occasional. Introduced from Asia and escaped from cultivation.

14. SILENE L. Catchfly, Campion

Key: Man. p.631

2. S. CUCUBALUS Wibel, Bladder Campion, Maiden's-Tears.—Roadsides, edges of waste places, cultivated ground. (Eaton, 1958.) Common. Naturalized from Eurasia.
6. S. antirrhina L., Sleepy Catchfly.—Dry or rocky open woods, fields, waste places, etc. (Deane, 1893.) Common, occasionally abundant.
— forma *Deaneana* Fern.—Similar habitats. (Eaton, 1958.) Uncommon.
7. S. ARMERIA L., Garden Catchfly.—Roadsides, fallow fields near habitations. (Hosmer, n.d.) Occasional. Introduced from Eurasia and escaped from cultivation.
12. S. NOCTIFLORA L., Night-flowering Catchfly.—Cultivated ground, waste places, roadsides, etc. (Hoar, 1882.) Common, often a troublesome weed. Naturalized from Europe.
13. S. caroliniana Walt. var. *pensylvanica* (Michx.) Fern., Pink

Catchfly or Campion.—Dry, sandy, gravelly or rocky woods, and openings. (Eaton, 1930.) Occasional.

15. SAPONARIA L.

1. **S. OFFICINALIS** L., Bouncing-Bet, Soapwort.—Roadsides, waste places, railroad ballast, etc. (Eaton, 1957.) Common. Naturalized from Europe.

16. GYPSOPHILA L.

4. **G. MURALIS** L.—Roadsides, fields, waste places. (Hosmer, n.d.) Local. Naturalized from Europe.

17. DIANTHUS L. Pink, Carnation

Key: Man. p.635

2. **D. ARMERIA** L., Deptford Pink.—Dry fields, roadsides. (Eaton, 1935.) Infrequent. (Frequent.) Naturalized from Europe.

Family 62. CERATOPHYLLACEAE (HORNWORT FAMILY)

1. CERATOPHYLLUM L.

1. **C. demersum** L.—Streams, ponds, quiet water. (H. S. Richardson, 1886.) Common.

Family 63. NYMPHAEACEAE (WATER-LILY FAMILY)

Key: Man. p.637

1. NUPHAR Sm. Cow-lily, Yellow Pond-lily

Key: Man. p.637

1. **N. microphyllum** (Pers.) Fern., Small Cow-lily.—Slow streams, pond margins. (Williams, 1908.) Formerly common, becoming scarce. (Common.)
2. × **N. rubrodiscum** Morong.—Similar habitats. (Eaton, 1920.) Frequent. (Uncommon.) Widely accepted as a fertile hybrid of Nos. 1 and 3.
3. **N. variegatum** Engelm., Common Cow-lily.—Similar habitats. (Hoar, 1858.) Very common.

2. NYMPHAEA L. Water-lily

Key: Man. p.640

1. **N. odorata** Ait., Fragrant Water-lily, Pond-lily.—Slow streams, pond margins. (Hoar, 1858.) Formerly abundant, recently becoming scarce. (Common.) River pollution believed to have depleted this species.
2. **N. tuberosa** Paine.—Slow streams. (Hellquist, 1971;)

#9069, 1973.) An addition to the flora of New England. Hellquist reports that this plant is commoner in the Sudbury River than *N. odorata*, perhaps because of the basic character of the river water owing to pollution.

3. NELUMBO Adans. Sacred Bean

1. *N. LUTEA* (Willd.) Pers.—Ponds, slow streams. (Martha Bartlett, 1886.) Uncommon. (Rare.) The Bartlett specimen is annotated “Concord River, introduced.” Now abundant in Great Meadows impoundment; also occurs in Bateman’s Pond, possibly indigenous; a single plant found in Sudbury River near Clam Shell Bluff in 1971.

4. BRASENIA Schreb. Water-shield

A single species with us.

1. **B. Schreberi** Gmel., Water-shield.—Ponds and slow streams. (Hoar, 1886.) Formerly common to abundant, now scarce except in unpolluted waters. (Common.)

5. CABOMBA Aubl.

1. *C. CAROLINIANA* Gray, Fanwort.—Ponds and slow streams. (Countryman and Richardson #1883, 1968.) Abundant in Fairhaven Bay and occurs downstream in the river in Carlisle, Bedford, Billerica, and Lowell. (Reported elsewhere in Middl. from Framingham, Wayland, and Stowe.) Naturalized from farther south and rapidly spreading. Earliest Massachusetts specimen seen was collected in Bridgewater, Plymouth Co., Massachusetts, in 1935.

Family 64. RANUNCULACEAE (Crowfoot Family)

Key: Man. p.642

1. *RANUNCULUS* L. Crowfoot, Buttercup
Key: Man. p.643
2. *R. trichophyllum* Chaix var. *trichophyllum*, White Water-Crowfoot.—Ponds, brooks, river margins. (Hoar, 1858.) Uncommon.
7. *R. flabellaris* Raf., Yellow Water-Crowfoot.—Quiet streams, pools, ponds. (Hoar, 1858.) Rather common. (Uncommon.)
13. *R. reptans* L. var. *ovalis* (Bigel.) T. & G.—Sandy,

gravelly, or muddy shores. (Perkins, 1880.) Uncommon.

21. *R. abortivus* L. var. *abortivus*, Kidneyleaf-Buttercup.—Moist low woods, wet clearings. (Eaton, 1961.) Frequent. (Common.)
25. *R. recurvatus* Poir.—Swampy rich woods, wooded brook-sides. (Eaton, 1958.) Infrequent. (Frequent.)
30. *R. fascicularis* Muhl., Early Crowfoot.—Thin, sweet soils in open woods, cliffs or ledges. (Hoar, 1858.) Uncommon, becoming rare. (Uncommon.)
32. *R. REPENS* L. var. *REPENS*, Creeping Buttercup.—Moist lawns, wet open ground, ditches, etc. (C. Jarvis or E. Jarvis, n.c.d.; Hoar, 1858.) Common. A difficult weed to eliminate. Naturalized from Europe.
—var. *VILLOSUS* Lamotte.—Similar habitats. (Hoar, 1858.) Apparently rare. Naturalized from Europe.
33. *R. ACRIS* L., Tall Buttercup.—Fields, meadows, roadsides, pastures, etc. (Hoar, 1858.) Abundant. Ubiquitous weed. Naturalized from Europe.
34. *R. BULBOSUS* L. var. *BULBOSUS*, Bulbous Buttercup.—Open woods, fields, pastures. (Eaton, 1961.) Frequent. (Common.) Naturalized from Europe.
—var. *VALDEPUBENS* (Jord.) Briq.—Dry open rocky woods. (Eaton, 1956.) Rare. (Not recorded elsewhere from Middl.) Naturalized from Europe. Plant is copiously hoary-villous.

4. *THALICTRUM* L. Meadow-Rue

Key: Man. p.656

5. *T. dioicum* L., Early Meadow-Rue.—Rich open woods, often rocky. (Hoar, 1857.) Rare. (Infrequent.)
8. *T. DASYCARPUM* Fisch. & Lall., Purple Meadow-Rue.—Waste ground, low ground. (Eaton, 1958.) Rare. (Not otherwise reported in Massachusetts.) Adventive from Midwest, probably a garden escape.
10. *T. polygamum* Muhl. var. *polygamum*, Tall Meadow-Rue.—Meadows, swamps, low thickets. (Deane, 1886.) Common.

5. *ANEMONELLA* Spach

1. *A. thalictroides* (L.) Spach, Rue-Anemone.—Open woods, usually on dry circumneutral soils. (Eaton, 1922.) Uncommon. (Occasional.)

6. HEPATICA Mill. Liverleaf, Hepatica

1. **H. americana** (DC.) Ker, Hepatica.—Rich open woods. (Eaton, 1922.) Rare. (Occasional.) A single station where scarce.

7. ANEMONE L. Anemone

Key: Man. p.660

6. **A. virginiana** L., Thimbleweed.—Dry or rocky open woods. (Eaton, 1958.) Uncommon, but widespread.

10. **A. quinquefolia** L., Wood-Anemone.—Open woods and clearings. (Hoar, 1858.) Common, often abundant.

8. CLEMATIS L. Clematis

Key: Man. p.663

1. **C. virginiana** L., Wild Clematis, Virgin's-bower.—Moist or swampy thickets, roadsides. (Anne Richardson, 1958.) Uncommon. (Frequent.)

10. CALTHA L. Marsh-Marigold

1. **C. palustris** L., Cowslip, Marsh-Marigold.—Wet, wooded and open swamps, brook borders. (Hoar, 1887.) Common.

12. COPTIS Salisb. Goldthread

1. **C. groenlandica** (Oeder) Fern., Goldthread.—Mossy or wet woods and glades. (Hoar, 1858.) Common.

13. AQUILEGIA L. Columbine

Key: Man. p.668

1. **A. canadensis** L. var. **canadensis**, Wild Columbine.—Rocky woods, niches in ledges, mostly in circumneutral to slightly alkaline soil. (H. Mann, Jr., 1862.) Infrequent. (Frequent.)

2. **A. vulgaris** L., Garden Columbine.—Roadsides, shrubberies, disturbed soil. (Hosmer, n.d.) Occasional, especially around dwellings. Introduced from Europe and escaped from cultivation.

17. ACTAEA L. Baneberry

1. **A. rubra** (Ait.) Willd., Red Baneberry, Snakeberry.—Rich woods, thickets, roadsides. (E. Barrett, 1835; Hosmer, n.d.) Rare. (Uncommon.) The Barrett specimen is in U. Mass., ex Old Mass. Cabinet. Not recently collected.

2. **A. pachypoda** Ell., White Baneberry.—Similar habitats. (Eaton, 1956.) Rare. (Infrequent.) Known from only two stations.

19. XANTHORHIZA Marsh.

1. *X. SIMPLICISSIMA* Marsh., Shrub-Yellowroot. — Moist ground. (Hosmer, n.d.; R. Bye #2059, 7 May 1972, Estabrook Woods where well established.) Rare. The only records from Middl. Introduced from farther south and escaped from cultivation.

Family 65. BERBERIDACEAE (BARBERRY FAMILY)

Key: Man. p.672

1. PODOPHYLLUM L. May-apple, Mandrake

1. *P. PELTATUM* L. — Rich soils along roadsides, near habitations. (Hosmer, n.d.; Eaton, 1961.) Rare. (Uncommon.) Introduced from farther west or south and escaped from cultivation.

4. CAULOPHYLLUM Michx. Blue Cohosh

2. *C. THALICTROIDES* (L.) Michx. — Rich woods, shaded roadsides. (Hosmer, n.d.) Rare. In Concord, introduced from farther west by Minot Pratt (Rh. 1: 170). Believed not to occur as an indigenous plant in Middl.

5. BERBERIS L. Barberry

Key: Man. p.674

2. *B. VULGARIS* L., Common Barberry. — Pastures, roadsides, thickets. (Hoar, 1858.) Common. Naturalized from Europe.
3. *B. THUNBERGII* DC., Japanese Barberry. — Moist low woods, old orchards, pastures, etc. (Eaton, 1957.) Common. Often an abundant escape from cultivation, and thoroughly naturalized from Asia.

Family 67. MAGNOLIACEAE

1. MAGNOLIA

Key: Man. p.675

4. *M. TRIPETALA* L., Umbrella-tree. — Low deciduous woods. (Eaton #6678; Katharine H. Teele, 6 June 1974.) Spreading freely from three mature trees about 10–12 meters high and 2 decimeters in diameter, with several half-grown flowering specimens and many seedlings scattered over an area of about one-quarter acre. Probably introduced by Minot Pratt prior to 1875.

Family 70. LAURACEAE (LAUREL FAMILY)

Key: Man. p.677

2. SASSAFRAS Nees Sassafras

1. **S. albidum** (Nutt.) Nees var. **albidum**, White Sassafras.—Dry open woods and thickets. (Eaton, 1957.) Uncommon.
—var. **molle** (Raf.) Fern.—Similar habitats. (Eaton, 1957.) More common than the preceding.

4. LINDERA Thunb. Wild Allspice, Feverbush

1. **L. Benzoin** (L.) Blume, Spicebush.—Low woods, damp clearings, brooksides. (Hoar, 19 Sept.) Frequent.

Family 71. PAPAVERACEAE (POPPY FAMILY)

Key: Man. p.679

1. SANGUINARIA L. Bloodroot

1. **S. canadensis** L., Bloodroot.—Rich woods, fencerows, roadsides, etc., on sweet soil. (Hosmer n.d.; Eaton, 1922, 1958.) Uncommon. Two known stations. (Infrequent.)

3. CHELIDONIUM L. Celandine

1. **C. MAJUS** L.—Rich soil in settled area. (Hoar, 1858.) Common. Usually weedy. Naturalized from Europe.

8. ADLUMIA Raf. Climbing Fumitory

1. **A. fungosa** (Ait.) Greene.—Rocky wooded slopes and moist ledges. (Hosmer, n.d.) Rare. (Rare and local.) Reported by Eaton as a casual climber on *Berberis* hedge, Concord, ca. 1910, not persisting.

9. DICENTRA Bernh.

1. **D. CUCULLARIA** (L.) Bernh., Dutchman's-Breeches.—Rich open moist woods, often on calcareous soil. (Hosmer, n.d.) Introduced from farther west by Minot Pratt (see Rh. 1: 170). Present status unknown.

10. CORYDALIS Medic.

A single species with us.

1. **C. sempervirens** (L.) Pers., Pale Corydalis.—Cliffs, ledges, rocky places, disturbed roadside gravels. (G. C. Mann, 1862; Eaton, 1922.) Rare. (Occasional, but generally distributed.) Thoreau reported finding plants on top of Fairhaven Cliffs, where fertilized by spring burnings, cut as weeds in September, and measuring 2½ feet

high and $\frac{5}{8}$ of an inch thick at base, still well in bloom and gone to seed. (Th. J. 9: 87.)

11. FUMARIA L. Fumitory

1. F. OFFICINALIS L., Common Fumitory.—Cultivated and waste ground. (Deane, 1893.) Rare and casual. Adventive from Europe.

Family 72. CAPPARIDACEAE (CAPER FAMILY)

Key: Man. p.684

3. CLEOME L.

2. C. SPINOSA Jacq., Spider-flower.—Waste ground or alluvium. (Eaton, 1959.) (Records of spontaneous occurrences from Barnstable, Massachusetts, 1973, and southwestern Connecticut, 1905 and 1941.) Introduced and naturalized from the tropics.

Family 73. CRUCIFERAE (MUSTARD FAMILY)

Key: Man. p.685

1. DRABA L.

A single species with us.

20. D. Verna L. var. Verna, Whitlow-grass.—Fallow fields, nurseries, edges of cart tracks, etc. (Hosmer, n.d.; Eaton, 1962.) Abundant at a single station. (Infrequent; increasing.) Mostly weedy and often abundant where established. Two vars.: var. *verna* and var. *Boerhaavii* Van Hall are recognized, the latter more common with us, but require fruiting material for separation. Naturalized from Europe.

2. BERTEROA DC.

1. B. INCANA (L.) DC., Hoary Alyssum.—Fields, roadsides, and waste places. (Eaton, 1936.) Common, often abundant. Rapidly spreading. Naturalized from Europe.

6. THLASPI L. Penny-Cress

1. T. ARVENSE L., Field Penny-Cress, Fanweed, Stinkweed.—Cultivated fields, roadsides, waste places. (Eaton, 1957.) Infrequent. (Common.) Naturalized from Europe.

8. LEPIDIUM L. Peppergrass, Pepperwort

Key: Man. p.701

3. L. CAMPESTRE (L.) R. Br., Cow-Cress.—Fields and waste

places. (Eaton, 1935.) Infrequent. (Common.) Naturalized from Europe.

5. *L. virginicum* L., Poor-Man's Pepper.—Cultivated fields, dry open soil, waste places. (Eaton, 1958.) Common. An indigenous weed in eastern United States.
8. *L. DENSIFLORUM* Schrad.—Similar habitats. (Eaton, 1958.) Common. Naturalized from farther west and south, weedy.

13. *CAPSELLA* Medic. Shepherd's-Purse

1. *C. BURSA-PASTORIS* (L.) Medic. var. *BURSA-PASTORIS*, Shepherd's-Purse.—Cultivated ground, roadsides, waste ground. (Hoar, 1858.) Common. Naturalized from Europe. A widespread weed.

19. *RAPHANUS* L. Radish

1. *R. RAPHANISTRUM* L., Wild Radish.—Fields, waste places, roadsides, railroads, etc. (Hoar, 1858.) Frequent. (Common). Naturalized from Europe. [Thor.]
2. *R. SATIVUS* L., Garden Radish.—Old fields and waste places. [Thor.] Uncommon; seldom persisting. Introduced from Europe.

20. *BRASSICA* L. Mustard

Key: Man. p.707

2. *B. KABER* (DC.) L. C. Wheeler var. *PINNATIFIDA* (Stokes) L. C. Wheeler.—Cultivated fields, waste places. Naturalized from Eurasia.
4. *B. NIGRA* (L.) Koch, Black Mustard.—Cultivated fields, waste places. (Hoar, 1858.) Common. Naturalized from Eurasia.

25. *ALLIARIA* B. Ehrh. Garlic-Mustard

1. *A. OFFICINALIS* Andrz.—Rich roadside soils, waste ground, shaded banks, etc. (L. E. Richardson, 1969.) Abundant at a single station. (Uncommon.) Introduced and naturalized from Europe.

26. *SISYMBRIUM* L.

Key: Man. p.709

1. *S. OFFICINALE* (L.) Scop. var. *LEIOCARPUM* DC., Hedge-Mustard.—Waste land, neglected fields, roadsides. (Eaton, 1957.) Common. Naturalized from Europe. A widespread weed.
2. *S. ALTISSIMUM* L., Tumble-Mustard.—Similar habitats.

(Williams, 1908.) Common. Specimens 3 m tall occur on moist enriched soils such as abandoned piggeries, cowyards, etc. Naturalized from Europe.

30. *HESPERIS* L. Rocket

1. *H. MATRONALIS* L., Common Rocket.—Waste places, about dwellings, moist banks. (Eaton, 1958.) Frequent, occasionally abundant. Introduced and naturalized from Europe and escaped from cultivation.

31. *ERYSIMUM* L. Treacle-Mustard

Key: Man. p.712

Only two species with us, both from the Old World.

1. *E. CHEIRANTHOIDES* L., Wormseed-Mustard.—Cultivated fields, waste places, rich low ground. (Deane, 1900.) Uncommon. (Frequent.) Naturalized from the Old World.

32. *RORIPPA* Scop. Yellow Cress

Key: Man. p.714

8. *R. ISLANDICA* (Oeder) Borbas var. *ISLANDICA*.—Shores, wet ground. (Rodman, 1905, her specimen poorly prepared, determination doubtful.) Rare. (Uncommon.) Partly native, partly naturalized from Europe.

—— var. *fernaldiana* Butt. & Abbe.—Meadows, shores, wet ground. (Eaton, 1961.) Not common. (Frequent.) Native.

—— var. *hispida* (Desv.) Butt. & Abbe, Marsh Cress.—Similar habitats. (Hoar, 1857.) Common. Often abundant in our river meadows. Native.

33. *NASTURTIUM* R. Br. Watercress

1. *N. OFFICINALE* R. Br. var. *OFFICINALE*, (*Rorippa Nasturtium-aquaticum* (L.) Schinz & Thell.), True Watercress.—Brooks, rills, and springs. (L. E. Richardson, 1962.) Uncommon. Introduced and naturalized from Europe.

—— var. *MICROPHYLLUM* (Boenn.) Thell.—Similar habitats. (Hoar, 1858.) Uncommon. Naturalized from Europe.

34. *ARMORACIA* Gaertn., Mey. & Scherb.

1. *A. LAPATHIFOLIA* Gilib., Horseradish.—Moist ground, roadsides, old gardens. (H. Mann, Jr., 1862.) Occa-

sional. Spread from cultivation and very persistent.
Naturalized from Europe.

35. BARBAREA R. Br. Winter-Cress

Key: Man. p.717

1. B. VULGARIS R. Br. var. VULGARIS, Common Winter-Cress.—Moist fields, roadsides, meadows. (Eaton, 1961.) Frequent. Naturalized from Europe.
— var. ARCUATA (Opiz) Fries.—Similar habitats. (Eaton, 1961.) Similar habitats. (Eaton, 1961.) Common. Naturalized from Europe. Often an abundant weed in cultivated ground. [Thor.]

41. CARDAMINE L. Bitter Cress

Key: Man. p.720

2. C. bulbosa (Schreb.) BSP., Spring-Cress.—Springheads, wet woods. (Hosmer, n.d.) Uncommon. Generally distributed.
6. C. PRATENSIS L. var. PRATENSIS, Cuckoo-flower.—Meadows, brooksides. (L. E. Richardson, 1966.) Rare: two stations. (Occasional.) Naturalized from Europe. Casual in newly seeded lawns.
10. C. pensylvanica Muhl. var. pensylvanica.—Meadows, shores, borders of streams. (H. Mann, Jr., 1862.) Common.

43. ARABIS L. Rock-Cress

Key: Man. p.723

3. A. glabra (L.) Bernh., Tower-Mustard.—Ledges, cliffs, and fields; rich soil. (Fernald #9562, 1913.) Rare. (Uncommon.) Formerly abundant as a weed in a fallow field; see Rh. 38: 64 et seq. A specimen in Thor. Herb. is annotated "Turritis glabra ?? Sacramento [words illegible]." In Th. J. 10: 502-503 he records pressing the specimen found "in a rich grass-field on Sacramento Street" in Cambridge. He correctly identified the plant, the genus *Turritis* now included in *Arabis*.
7. A. Drummondii Gray.—Basic or circumneutral ledges cliffs, or talus. (Hoar, 1858; Fernald #9565, 1913.) Rare. (Uncommon.) Formerly frequent in fallow field as a weed; see Rh. 38: 64 et seq. [Thor.]
11. A. canadensis L., Sicklepod.—Rich, rocky woods and

banks. (Eaton, 1932; 1958.) Rare: two stations. (Occasional.) [Thor.]

Family 75. SARRACENIACEAE (PITCHER-PLANT FAMILY)

1. SARRACENIA L. Pitcher-plant

Key: Man. p.728

1. *S. purpurea* L., Pitcher-plant, Sidesaddle-flower. — Sphagnum bogs, swamps, and pond margins. (Perkins, 1886.) Rather common.

Family 76. DROSERACEAE (SUNDEW FAMILY)

1. DROSERA L. Sundew

Key: Man. p.729

1. *D. intermedia* Hayne. — Acid peats and sands, often sphagnum. (Hoar, 1879.) Common.
4. *D. rotundifolia* L. — Similar habitats. (Eaton, 1920.) Common.

Family 78. CRASSULACEAE (ORPINE FAMILY)

Key: Man. p.731

2. SEDUM L. Stonecrop, Orpine

Key: Man. p.732

12. *S. purpureum* (L.) Link, Live-forever. — Moist grassland, open banks, near old habitations, etc. (Eaton, 1961.) Common. Often an abundantly aggressive weed, reproducing vegetatively.

Family 79. SAXIFRAGACEAE (SAXIFRAGE FAMILY)

Key: Man. p.735

1. PENTHORUM L. Ditch-Stonecrop

1. *P. sedoides* L. — Wet, low ground, meadows, riverbanks. (Hoar, 1857.) Scarce: formerly common; perhaps a casualty of river pollution. (Common.)

5. SAXIFRAGA L. Saxifrage

Key: Man. p.737

7. *S. virginiana* Michx., Early Saxifrage. — Cliffs, ledges, dry rocky open woods. (Hoar, 1858.) Infrequent.
10. *S. pensylvanica* L., Swamp Saxifrage. — Wet meadows, swamps. (Eaton, 1932.) Frequent.

9. CHRYSOSPLENIUM L. Golden Saxifrage

1. *C. americanum* Schwein., Water-mat, Water-carpet. —

Springy ground, rills, riverbanks. (Hoar, 1858.) Frequent.

15. RIBES L. Gooseberry, Currant

Key: Man. p.748

4. R. hirtellum Michx.—Rocky or swampy woods and clearings. (Eaton, 1935.) Formerly common. Much less frequent since the attempted eradication of all species of *Ribes* in effort to control pine-tree blister.
11. R. SATIVUM Syme, Garden or Red Currant.—Open woods, thickets. (Williams, 1935.) Formerly frequent. See comment above. Introduced and naturalized from Europe.
15. R. ODORATUM Wendland f., Buffalo Currant.—With us, rich moist open ground. (Cheever and Cooke, 1910; Eaton, 1960.) Rare. Introduced from farther west and escaped from cultivation. Eaton's specimen was found on the side of a dike at the filter beds, and was spreading by natural layering.

Family 80. HAMAMELIDACEAE (WITCH-HAZEL FAMILY)

1. HAMAMELIS L. Witch-hazel

1. H. virginiana L.—Dry or moist woods and clearings. (Eaton, 1935.) Frequent.

Family 81. PLATANACEAE (PLANE-TREE FAMILY)

1. PLATANUS L. Sycamore, Buttonwood, Plane-tree

1. P. occidentalis L.—Low woods, stream banks, alluvial soils. (Eaton, 1957.) Infrequent. Scattered trees along Spencer Brook near Barrett's Mill Road; a single tree on riverbank below Flint's Bridge. Occasionally planted as a shade tree.

Family 82. ROSACEAE (ROSE FAMILY)

Key: Man. p.753

1. PHYSOCARPUS Maxim.

1. P. OPULIFOLIUS (L.) Maxim.—Roadsides, abandoned house sites, near dwellings. (Eaton, 1963.) Rare. Escaped from cultivation or adventive from farther south.

2. SPIRAEA L. Spiraea

Key: Man. p.755

2. S. latifolia (Ait.) Borkh., Meadow-sweet.—Dry or usually

moist open ground. (Hoar, 1857.) Common. Often abundant in old pastures, forming thickets.

3. S. **tomentosa** L., Hardhack, Steeplebush. — Old pastures, sterile low ground, pond shores. (Eaton, 1930.) Very common.

4. SORBARIA A. Br. False Spiraea

1. S. **SORBIFOLIA** (L.) A. Br. — Roadsides, waste land. (Eaton, 1957.) Occasional. Escaped from cultivation and naturalized from Asia.

6. PYRUS L.

Key: Man. p.757

3. P. **MALUS** L., Apple. — Roadsides, old pastures, borders of woods, etc. (Eaton, 1835.) Occasional. Introduced and naturalized from Europe.

✗ P. **ARNOLDIANA** (Rhed.) Bean, (*P. baccata* L. × *P. floribunda* Lindl.). — Thickets, roadsides, etc. (L. E. Richardson, May 1964, July 1965. Both collected from the same tagged tree, clearly spontaneous.) Rare. (Determined by S. Y. Hu of Arnold Arboretum.)

✗ P. **MAGDEBURGENSIS** Spach, (*P. pumila* Mill. × *P. spectabilis* Ait.). — Similar habitats. (L. E. Richardson, Sept. 1965: fruiting twig; Eaton, Nov. 1965: new growth with leaves and winter buds. Both collected from same tagged tree.) Rare. Presumably a fertile hybrid and clearly spontaneous. (Determined by S. Y. Hu.)

10. P. **floribunda** Lindl., Purple Chokeberry. — Wet to dry peaty ground, roadsides, thickets, etc. (Hoar, 1858.) Frequent. Not to be confused with the more southern *P. arbutifolia* (L.) L. f. which reaches Essex Co., Massachusetts, coastwise, where rare. The latter species is distinguished from it by its stipitate-glandular sepals and its smaller bright to dull red fruits.

— P. **floribunda** × P. **melanocarpa**. (Eaton, 1930.) Is a suppositious hybrid intermediate between No. 10 and the following species. Rare.

11. P. **melanocarpa** (Michx.) Willd., Black Chokeberry. — Similar habitats or frequently on drier ground, bluffs and cliffs. (Hoar, 1858.) Common.

12. *P. americana* (Marsh.) DC., American Mountain Ash.
Open woods. (Eaton, 1942.) Rare. The only record
from Middl. and based on small sapling in thin oak
woods far from any habitation, clearly spontaneous.
14. *P. AUCUPARIA* (L.) Gaertn., European Mountain Ash.—
Woods, thickets. (Eaton, 1957.) Occasional. Introduced
and naturalized from Europe.

7. *AMELANCHIER* Medic. Shadblush

Key: Man. p.761

9. *A. stolonifera* Wieg. forma *stolonifera*.—Dry, sterile
(acid) open ground. (Eaton, 1935.) Infrequent.
— forma *micropetala* (Robins.) Rehd. (Eaton, 1930.)
Rare.
15. *A. canadensis* (L.) Medic.—Dry or low or swampy open
places and thickets. (Hoar, 1858.) Very common. Our
commonest species.
17. *A. arborea* (Michx. f.) Fern.—Dry, often rich woods
and thickets. (Eaton, 1956.) Rare. (Apparently rare.)
18. *A. laevis* Wieg., Pink-leaved Shad.—Dry to moist open
woods, thickets, clearings. (Hoar, 1858.) Uncommon.
(Scarce eastward in Middl.)

8. *CRATAEGUS* L. Hawthorn, Thorn

Key: Man. p.767. See also Seymour's key in Fl. N. E. 1968, p.312 et seq.
and particularly the excellent photographic illustrations of leaves and
fruits from type specimens.

19. *C. crus-galli* L., Cockspur Thorn.—Open ground, old pastures
(often dry or rocky), thickets, borders of woods.
(Eaton, 1957; #5650, 1964; #5987, 1966.) No specimens seen northeast of Concord and Middlesex Fells,
nor elsewhere in eastern Massachusetts except Martha's Vineyard and Nantucket.
56. *C. macrosperma* Ashe var. *macrosperma*.—Similar habitats.
(Hoar, 1857; L. E. Richardson, 1964.) Infrequent. (Frequent.)
— var. *acutiloba* (Sarg.) Egglest. (L. E. Richardson,
1964.) Infrequent.
— var. *roanensis* (Ashe) Palmer, (*C. roanensis* Ashe).
(Eaton, #5680, 1964.) Infrequent.
62. *C. flabellata* (Spach) Kirchn. var. *Grayana* (Egglest.)
Palmer, (*C. Grayana* Egglest.). (Eaton #5649, and
#5979, 1964.) Infrequent.

82. *C. Holmesiana* Ashe var. *villipes* Ashe. (L. E. Richardson, 1964, flower and fruit.) Infrequent.
96. *C. succulenta* Link var. *macracantha* (Lodd.) Egglest. (Purdie, 1886.) Infrequent.

10. **FRAGARIA** L. Strawberry

Key: Man. p.802

1. *F. virginiana* Duchesne var. *virginiana*. — Fields and banks, dry or moist. (Eaton, 1950.) Abundant.
— var. *terraenovae* (Rydb.) Fern. & Wieg. (F. W. Hunnewell, 1916.) Rare. (Apparently rare.)

15. **POTENTILLA** L. Cinquefoil

Key: Man. p.804

1. *P. fruticosa* L., Shrubby Cinquefoil. — Dry or wet open ground, meadows, old pastures, usually sweet soil. (Hoar, n.d.; Hosmer, n.d.) Rare. (Rare in eastern Massachusetts except Essex Co.) Concord station extirpated.
4. *P. palustris* (L.) Scop. var. *palustris*. — Wet meadows, swamps, often subaquatic. (Hoar, 1879.) Infrequent. A remarkable stand occurs in the meadow south of Lee's Bridge, perhaps a quarter acre in extent, virtually excluding other vegetation.
— var. *villosa* (Pers.) Lehm. — Similar habitats. (Deane, 1886.) Rare.
5. *P. arguta* Pursh, Tall Cinquefoil. — Open ground, usually circumneutral or alluvial soils. (Hoar, 7 Aug.) Infrequent.
7. *P. ARGENTEA* L., Silvery Cinquefoil. — Dry open ground, old fields, waste places. (Hoar, 1857.) Very common. Naturalized from Europe.
15. *P. RECTA* L. — Dry fields, roadsides, waste places. (Eaton, 1956.) Common. Naturalized from Europe.
21. *P. norvegica* L. — Similar habitats and often damp ground. (Eaton, 1930.) Common.
30. *P. canadensis* L. — Dry open soil, sandy fields, starved lawns. (H. Mann, Jr., 1862.) Common.
31. *P. simplex* Michx. var. *simplex*. — Dry or moist fields, open glades and woods. (Eaton, 1930.) Common.
— var. *calvescens* Fern. — Similar habitats. (Hoar, 1857.) Less common than preceding variety.

18. GEUM L. Avens

Key: Man. p.814

1. **G. canadense** Jacq. var. **canadense**. — Rich sparse woods and thickets or shaded ground. (Hoar, 1887.) Infrequent. (Frequent.)
— var. **camporum** (Rydb.) Fern. & Weath. — Open woods, fields, roadsides. (Eaton, 1957.) Infrequent.
3. **G. laciniatum** Murr. var. **trichocarpum** Fern. — Damp thickets, banks, meadows. (Eaton, 1933.) Frequent.
4. **G. aleppicum** Jacq. var. **strictum** (Ait.) Fern. — Thickets, meadows, fallow fields. (Eaton, 1934.) Infrequent. (Infrequent but widely distributed.)
7. **G. rivale** L., Water- or Purple Avens. — Wet peaty meadows and bogs. (Hoar, 1858.) Common.

19. RUBUS L. Bramble

Key: Man. p.818. See also key by Hodgdon and Steele in Fl. N. E., pp. 334–335, and originally published in Rh. 68: 474–512, 1966. When collecting *Rubus*, especially species of the subgenus *Eubatus*, it is necessary to take both primocane and floricanes from the same plant, and to make careful field notes of habit and size.

2. **R. pubescens** Raf. — Damp, sandy slopes, low thickets, rocky shores. (H. Mann, Jr., 1862.) Uncommon. Occurs in nine towns in Middl.
5. **R. odoratus** L., Purple-flowering Raspberry. — Thickets, borders of woods, roadsides. (Middlesex Flora label, handwriting of F. S. Collins, n.c.d.; A. W. Hosmer, n.c.d.; C. Handel #70, 30 June 1972, specimen in herbarium of Concord Field Station.) Rare. (Uncommon.)
9. **R. idaeus** L. var. **strigosus** (Mich.) Maxim., Raspberry. — Thickets, clearings, roadsides, old pastures, etc. (Eaton, 1921.) Uncommon. (Frequent.)
10. **R. occidentalis** L., Black Raspberry. — Clearings, thickets, rich open soils. (Hoar, 1858.) Frequent.
38. **R. Enslenii** Tratt. — Similar habitats, dry or moist. (Eaton, 1960; 1963.) Infrequent.
55. **R. recurvicaulis** Blanch. — Dry or gravelly open habitats, railroads. (Eaton, 1958.) Rare.
60. **R. hispida** L. var. **hispida**. — Moist open woods, dry or moist open soil. (Eaton, 1935.) Uncommon.
— var. **obovalis** (Michx.) Fern. — More often in damp habitats. (Hoar, 1857.) Frequent.

— × *setosus* Bigel. (Eaton, 1956, fide Hodgdon and Steele.) — Swampy woods, north side of Cambridge Turnpike, opposite ice-pond.

— × *vermontanus* Blanch. (Eaton, #5946, 1966.) (Determined by A. R. Hodgdon, 1966.)

131. **R. semisetosus** Blanch. — Dryish to damp fields, moist thickets, etc. (Eaton, 1961; 1962.) Rare. No other specimens in NEBC from Essex, Middlesex, or Suffolk counties, Massachusetts.
154. **R. allegheniensis** Porter, Sow-teat Bramble. — Dry or moist clearings, thickets, banks, etc. (Eaton, 1958.) Uncommon, though locally abundant.
184. **R. pensylvanicus** Poir. — Similar habitats. (Eaton, 1935.) Uncommon, but occasionally abundant. (Frequent.)

22. AGRIMONIA L. Agrimony

Key: Man. p.866

1. **A. gryposepala** Wall. — Thickets and woods or shaded copses. (Hoar, 1886.) Frequent.
2. **A. striata** Michx. — Similar habitats. (Deane, 1887.) Uncommon. (Generally distributed but infrequent.)

24. ROSA L. Rose

Key: Man. p.868

2. **R. MULTIFLORA** Thunb. var. **MULTIFLORA**. — Roadsides, orchards, fields, etc. (Eaton, 1961.) Rapidly becoming frequent. Fruit persistent and attractive to birds, its seeds thus widely disseminated. This collection referred by Seymour to var. *calva* Franch & Sav. which is not recognized in Man. Introduced and naturalized from Europe.
7. **R. EGLANTERIA** L., Sweet-brier, Eglantine. — Thickets, clearings, roadsides, etc. (Deane, 1886.) Infrequent. Introduced and naturalized from Europe.
10. **R. nitida** Willd. — Swamps, meadows, bogs, pond shores. (Deane, 1886.) Common.
11. **R. virginiana** Mill. — Meadows, damp to dry thickets, clearings. (Hoar, 1858.) Very common. Fertile branches commonly without prickles is a form recently designated as forma *innoxia* Seymour.
12. **R. palustris** Marsh. — Swamps, wet meadows and shores. (Deane, 1886.) Common.

13. **R. carolina** L., Pasture Rose.—Dry thickets, pastures, rocky ground or open sandy habitats. (Deane, 1886.) Common.
25. **PRUNUS** L. Plum, Cherry
Key: Man. p.874
2. **P. maritima** Marsh., Beach Plum.—Sandy soil, roadsides. (Hoar, 1858.) Rare, not seen in recent years. (Infrequent, scattered stations.)
5. **P. americana** Marsh., Wild Plum.—Thickets, roadsides, fencerows, borders of woods, etc. (Eaton, 11, 17 May, 30 Aug. 1965.) Rare. (Uncommon.)
6. **P. nigra** Ait., Canada Plum.—Similar habitats. (Hoar, 1887; Jenks, 6 July 1888, and 5 May 1889, presumably from same tree.) Rare. (Uncommon.)
12. **P. susquehanae** Willd., Sand-Cherry.—Scrub-oak woods, sterile sandy or other open acid habitats. (Eaton, 24 May 1939 and 9 July 1939, from same station.) Uncommon.
15. **P. pensylvanica** L. f., Bud- or Pin- or Fire-Cherry.—Dry open woods, roadsides, fencerows, recent burns. (Eaton, 1935.) Common.
19. **P. serotina** Ehrh., Black or Rum-Cherry.—Dry or moist woods and roadsides. (Eaton, 1930.) Common; mature trees scarce.
20. **P. virginiana** L., Choke-Cherry.—Roadsides, thickets, borders of woods, moist or dry. (Hoar, 1886.) Common. In some soils, weedy and troublesome.

Family 83. LEGUMINOSAE (PULSE FAMILY)

Key: Man. p.879 or for a simpler but highly artificial key, see Fl. N. E. p.347.

6. **GLEBITSIA** L. Honey-Locust

1. **G. TRIACANTHOS** L., Honey-Locust.—Roadsides. (Eaton, 1958.) Rare. An occasional escape from cultivation. Introduced from farther west and south. Abundantly spontaneous as seedlings near a single tree on Barrett's Mill Road, Concord.

7. **CASSIA** L. Senna

Key: Man. p.885

1. **C. hebecarpa** Fern., Wild Senna — Roadsides, fields, chiefly on alluvial soils. (Deane, 1886.) Rare. (Scarce.) A

small colony along Lexington Road near Lincoln boundary persisted until about 1905. Pratt found it "below Leighton's by the roadside."

5. C. *fasciculata* Michx., Partridge Pea.—Sandy open soil, railroad embankments, etc. (Eaton, 1938). Rare, two stations. (Uncommon.) Concord apparently marks northwestern limit of range in Massachusetts.

9. BAPTISIA Vent. False Indigo

1. B. *tinctoria* (L.) R. Br. var. *crebra* Fern., Wild Indigo.—Roadsides, dry fields, clearings. (Deane, 1886.) Common.

13. CROTALARIA L. Rattlebox

1. C. *sagittalis* L.—Dry gravelly or sandy soil. (Williams, 1902.) Formerly uncommon, now very scarce. Thoreau noted it as still in bloom in front of Caesar's on 9 Sept. 1852 (Th. J. 4: 348). The plant still persists sparingly in the vicinity, *i.e.*, near the filter beds. Thoreau also found it along railroad near Walden (Th. J. 11: 193).

14. GENISTA L. Genista

1. G. TINCTORIA L., Dyer's Greenwood.—Dry, often sterile soil, old pastures, fallow fields. (Hoar, 1858.) On Hoar's label is written in Hoar's hand: "A new arrival in this vicinity behind N. Barrett's hill. D.H.T.", obviously quoting a remark of Thoreau's. Now known from vicinity of Clam Shell Bluff, where well established. (Eaton, 1957.) Rare. (Occasional.) Naturalized from Europe.

17. LUPINUS L. Lupine

1. L. *perennis* L., Wild Lupine.—Dry sandy banks, open gravelly places. (Hoar, 1858.) Scarce, becoming rare. (Infrequent.) Greatly depleted in our area in recent years.

18. TRIFOLIUM L. Clover, Trefoil

Key: Man. p.891

1. T. ARVENSE L., Rabbit-foot Clover.—Dry roadsides and fields. (Hoar, 1858.) Common. Naturalized from Europe.
6. T. PRATENSE L. var. PRATENSE, Red Clover.—Fields, roadsides, grassy places. (Hoar, 1868.) Common. Naturalized from Europe.

- var. *SATIVUM* (Mill.) Schreb., Cultivated Red Clover. (Eaton, 1958.) Abundant. Naturalized from Europe.
9. *T. REPENS* L., White Clover. — Grasslands, roadsides, pastures, etc. (Hosmer, n.d.) Abundant, often weedy. Naturalized from Europe.
12. *T. HYBRIDUM* L. var. *HYBRIDUM*, Alsike Clover. — Fields, roadsides, moist grasslands. (Hoar, 1886.) Uncommon. Introduced from Europe and escaped from cultivation.
- var. *ELEGANS* (Savi) Boiss. — Similar habitats. (Deane, 1893.) Common. Introduced and naturalized from Europe.
15. *T. AGRARIUM* L., Yellow or Hop Clover. — Dry fields, roadsides, waste ground, etc. (Hoar, 1857.) Common. Naturalized from Europe.
16. *T. PROCUMBENS* L., Low Hop-Clover. — Similar habitats. (Hosmer, n.d.) Rather common. Naturalized from Europe.

19. *MELILOTUS* Mill. Sweet Clover

Key: Man. p.894

1. *M. OFFICINALIS* (L.) Lam., Yellow Sweet Clover. — Rich open soils, roadsides, waste places. (Eaton, 1934.) Uncommon. (Common, especially in sweet soils.) Naturalized from Europe.
4. *M. ALBA* Desr., White Sweet Clover. — Similar habitats. (Eaton, 1958.) Uncommon. (Less common than preceding species.) Naturalized from Europe.

20. *MEDICAGO* L. Medick

Key: Man. p.895

1. *M. SATIVA* L., Alfalfa. — Rich or sweet open ground. (Hoar, 1889.) Occasionally persistent after cultivation, thriving mostly in calcareous or artificially limed soils. Introduced from Old World.
3. *M. LUPULINA* L. var. *LUPULINA*, Black Medick. — Dry fields, roadsides, cultivated land. (Hoar, 1890.) Common. Naturalized from Europe.

24. *AMORPHA* L.

5. *A. FRUTICOSA* L. var. *FRUTICOSA*, False Indigo. — Moist roadsides, banks, thickets. (Eaton, 1956; L. E. Richardson, 1965.) Uncommon. (Rare, perhaps becoming un-

common.) Introduced from south and west and apparently only recently naturalized in Middl.

28. **TEPHROSIA** Pers. Hoary Pea

1. **T. virginiana** (L.) Pers., Goat's Rue, Catgut. — Dry open woods, gravelly banks, roadsides. (Boott, 1886, ex Herb. A. Gray.) Uncommon: known from three locations in Concord. (Scarce.)

30. **ROBINIA** L. Locust

Key: Man. p.902

1. **R. PSEUDO-ACACIA** L., Black Locust. — Roadsides, fence-rows, etc. (H. Mann, Jr., 1862.) Occasional. (Common.) Introduced and naturalized from farther south and west.
4. **R. HISPIDA** L., Bristly Locust, Rose-Acacia. — Dry banks, open dry soils. (Eaton, 1958.) Abundant at two stations, one colony producing viable seeds, the other infertile and perhaps a hybrid. Introduced from farther south and escaped from cultivation. (Uncommon.)

37. **CORONILLA** L. Crown-Vetch

1. **C. VARIA** L. — Roadsides, waste places, near old dwellings, etc. (Jenks, 1895.) Occasional; abundant at a recently discovered station. (Infrequent.) Introduced and naturalized from Europe.

39. **DESMODIUM** Desv. Tick-trefoil, Tick-clover

Key: Man. p.915

1. **D. nudiflorum** (L.) DC. — Rich woods, often dry and rocky. (Hosmer, n.d.; Eaton, 1959.) Rare. (Frequent in sweet soils.)
2. **D. glutinosum** (Muhl.) Wood. — Similar habitats. (Hoar, 1957.) Uncommon. (Frequent.)
4. **D. rotundifolium** DC. — Dry woods. (Hoar, 5 Sept.; Williams, 1898.) Infrequent. Near northeastern limit of range in Concord.
6. **D. canescens** (L.) DC. — Dry fields and open woods. (Eaton, 1932.) Uncommon. Not reported north of latitude of Concord. Two other stations in Middl.
11. **D. rigidum** (Ell.) DC. — Dry oak woods. (Hoar, 1857.) Uncommon. (Frequent.)
12. **D. ciliare** (Muhl.) DC. — Dry woods. (Jenks, 1884.) Rare. (Occasional.) At northern limit of range in Middl.

13. *D. marilandicum* (L.) DC.—Dry open woods. (Swan, 1884.) Uncommon.
15. *D. canadense* (L.) DC.—Open woods, dry thickets. (Hoar, 1858.) Common.
21. *D. paniculatum* (L.) DC.—Dry open woods. (Hoar, 1857.) Uncommon. (Generally distributed but uncommon.)

40. LESPEDEZA Michx. Bush-Clover

Key: Man. p.923. See also key in Rh. 68: 367 (1966) by A. F. Clewell, whose concepts of the native North American elements of the genus have resulted from monographic studies based on a mass of living and herbarium material. His treatment differs in many respects from that of Fernald in the Man., particularly in respect to hybrids, e.g., *L. hirta* × *intermedia* replaces *L. Nuttallii* Darl.

9. *L. virginica* (L.) Britt.—Dry open woods, slopes, old pastures. (Hosmer, n.d.; Eaton, 1921.) Uncommon. (Occasional, but widely distributed in Middl.)
10. *L. intermedia* (S. Wats.) Britt.—Dry open woods and thickets. (Hoar, 1857.) Occasional. (Widely distributed.)
11. *L. capitata* Michx. var. *capitata*.—Dry open woods, roadsides, open sandy soils. (Eaton, 1957.) Apparently infrequent.
— var. *vulgaris* T. & G.—Similar habitats. (Eaton, 1921.) Common. This var. not recognized by Clewell.
12. *L. hirta* (L.) Hornem.—Dry open woods, roadsides, old shady fields. (Hoar, 1857.) Common.
— × *Stuevei* Nutt. (Hoar, 1857.) Determined by A. F. Clewell, Feb. 1966. Previously determined by Fernald as *L. Nuttallii* Darlington.

44. VICIA L. Vetch

Key: Man. p.929

4. *V. ANGUSTIFOLIA* Reichard var. *SEGETALIS* (Thuill.) W.D.J. Koch.—Fields, waste places, roadsides. (Williams, 1908.) Common. Naturalized from Europe.
7. *V. TETRASPERMA* (L.) Moench var. *TETRASPERMA*.—Old fields, waste places, roadsides. (Eaton, 1936.) Rather common. Naturalized from Europe.
12. *V. CRACCA* L., Tufted Vetch, Canada-pea.—Grassy fields, thickets. (Weatherby, 1911.) Common. Naturalized from Europe.

45. LATHYRUS L. Wild Pea

Key: Man. p.933

5. *L. PRATENSIS* L., Yellow Vetchling.—Fields, roadsides, moist slopes. (Brewster, 1918; Batchelder, 1918: in fruit.) Casual. Known also in Massachusetts from Springfield. See Rh. 20: 204. Naturalized from Europe.

46. APIOS Medic. Groundnut, Wild Bean

1. *A. americana* Medic.—Rich thickets, moist shady banks. (Hoar, 1858.) Common.

54. AMPHICARPA Ell. Hog-Peanut

1. *A. bracteata* (L.) Fern. var. *bracteata*.—Damp woodlands. (Hoar, 1857.) Frequent in Walden-Fairhaven region. (Rather common.)

Family 85. OXALIDACEAE (WOOD-SORREL FAMILY)

1. OXALIS L. Wood-Sorrel

Key: Man. p.943

1. *O. montana* Raf., Common Wood-Sorrel.—Damp, cool woods. (H. Mann, Jr., 1862; Hosmer, n.d.) Rare. Not seen for many years in Concord, perhaps extirpated.
2. *O. violacea* L., Violet Wood-Sorrel.—Cool woods. (H. Mann, Jr., 1862; Hosmer, n.d.) Rare. Present status in Middl. unknown.
7. *O. europaea* Jord. forma *europaea*.—Fields, gardens, roadsides, etc. (H. Mann, Jr., 1862.) Common, often weedy.
——— forma *pilosella* Wieg. (Eaton, 1969.) Status?, but abundant at locality where collected.
——— forma *cymosa* (Small) Wieg. (Hoar, 1857.) Common.
——— forma *villicaulis* Wieg. (Hosmer, n.d.) Common.

Family 86. GERANIACEAE (GERANIUM FAMILY)

Key: Man. p.946

1. GERANIUM L.

1. *G. maculatum* L., Wild Geranium.—Open woods and thickets, brooksides, dry meadows. (Hoar, 1858.) Common.
13. *G. Robertianum* L., Herb-Robert.—Rich rocky woods, and cliffs. (Hosmer, n.d.) Rare. (Occasional. Sometimes abundantly weedy about old houses.)

2. ERODIUM L'Hér. Storksbill

Key: Man. p.950

1. **E. CICUTARIUM** (L.) L'Hér.—Fields, roadsides, waste places. (Hosmer, n.d.; L. E. Richardson, 1960.) Occasional. Sometimes weedy. Naturalized from Europe.

Family 88. RUTACEAE (RUE FAMILY)

1. XANTHOXYLUM Gmel. Prickly Ash

1. **X. americanum** Mill., Northern Prickly Ash.—Rich woods, rocky pastures, stream banks. (Hosmer, n.d.) Rare. (Uncommon.) Absent from southern half of Middl.

3. PTELEA L. Hop-tree

1. **P. TRIFOLIATA** L., Wafer-Ash.—Thickets, edges of woods, old pastures. (L. E. Richardson, 1969; Eaton #6637, 1970.) Rare. (Occasional.) Adventive or escaped from cultivation from farther west and south.

Family 91. POLYGALACEAE (MILKWORT FAMILY)

1. POLYGALA L. Polygala

Key: Man. p.953

1. **P. pauciflora** Willd. forma **pauciflora**, Fringed Polygala.—Woods in well-drained soil. (Hoar, 1858.) Frequent. Often abundant in large colonies.
— forma **alba** Wheelock. (Dame, 1895.) A vigorous colony discovered by Thoreau in 1853 has been under observation up to the present time. See Th. J. 5: 187.
2. **P. polygama** Walt. var. **obtusata** Chodat.—Dry sandy fields, woods and openings. (Hosmer, n.d.) Rare. (Infrequent but widely distributed in Middl.)
6. **P. sanguinea** L.—Fields, meadows, ditches, etc., in moist acid soils. (Hoar, 1857.) Common.
— forma **albiflora** (Wheelock) Millsp. (Weir, n.d.; Jenks, 1896.) Occasional.
13. **P. verticillata** L. var. **verticillata**.—Dry to moist sterile open habitats. (Hosmer, n.d.) Uncommon.
— var. **isocycla** Fern. (Hoar, 1857.) Frequent.

Family 92. EUPHORBIACEAE (SPURGE FAMILY)

Key: Man. p.958

5. ACALYPHA L. Three-seeded Mercury

Key: Man. p.961

1. **A. rhomboidea** Raf.—Fields, roadsides, gardens. (Wil-

- liams, 1898.) Common. Often weedy.
2. A. *virginica* L. — Dry fields, waste ground, old pastures. (Hoar, 3 Oct.; Eaton, 1959.) Uncommon. Abundant in south-facing pasture on Annurnsnack Hill.
 3. A. *gracilens* Gray. — Dry sterile soils. (Hoar, 1857.) Occasional. Widely distributed in Middl.

11. EUPHORBIA L. Spurge

Key: Man. p.964. See also generic diagnosis and footnote on pp. 963-964.

8. E. *CYPARISSIAS* L., Cypress Spurge. — Roadsides, fields, old cemeteries. (Eaton, 1958.) Scattered colonies. (Common.) Introduced and naturalized from Europe.
26. E. *SUPINA* Raf., *E. maculata* of authors, not L., Milk-Purslane. — Dry open soil, roadsides, weedy lawns. (Eaton, 1957.) Common. Weedy; probably adventive from farther west.
34. E. *maculata* L., Eyebane, Spotted Spurge. — Cultivated fields, roadsides, dry open waste places. (Hoar, 1857.) Uncommon.

Family 93. CALLITRICHACEAE (WATER-STARWORT FAMILY)

1. CALLITRICHE L. Water-Starwort

Key: Man. p.973

5. C. *palustris* L., (C. *verna* L., later name). — Quiet water of streams and ponds. (Eaton, 1933.) Infrequent. Widely distributed in Middl.
6. C. *heterophylla* Pursh. — Similar habitats. (Hoar, 1 Sept.) Common.

Family 97. ANACARDIACEAE (CASHEW FAMILY)

2. RHUS L. Sumac

Key: Man. p.976

1. R. *typhina* L., Staghorn-Sumac. — Dry thickets, roadsides, open rocky slopes. (H. Mann, Jr., 1862.) Infrequent. (Rather common.)
2. R. *glabra* L. — Dry fields, roadsides. (Hoar, 1857.) Common.
3. R. *copallina* L. var. *latifolia* Engler. — Similar habitats. (Hoar, 1857.) Frequent.
5. R. *Vernix* L., Poison Sumac, Poison Elder, Poison Dog-

wood.—Wooded swamps, bog margins. (Eaton, 1935.)
Frequent.

6. **R. radicans** L. var. **radicans**, Poison Ivy.—Climbing on trees, stone walls, trailing in fields, open woods, etc. (Eaton, 1957.) Common. Often abundantly dominant.
— var. **vulgaris** (Michx.) DC.—Wooded swamps, river bottoms, etc. (Eaton, 1935.) Locally common. (Apparently uncommon.)
— var. **Rydbergii** (Small) Rehd.—Dry woods and rocky slopes. (Eaton, 1960.) Uncommon.

Family 99. AQUIFOLIACEAE (HOLLY FAMILY)

1. **ILEX** L. Holly

Key: Man. p.980. For key to varieties of *I. verticillata*, see Fl. N. E. p.377.

7. **I. verticillata** (L.) Gray var. **verticillata**, Black Alder, Winter-berry.—Swamps, meadow thickets, pond margins, riverbanks. (Williams, 1896.) Common. This and the next two vars. are believed by some to be mere ecological forms of the type var., all three thought to have occurred as members of a single large clone.
— var. **padifolia** (Willd.) T. & G. (H. Mann, Jr., 1862.) Infrequent. (Frequent.)
— var. **tenuifolia** (Torr.) S. Watson. (Eaton, 1957.) Frequent.

2. **NEMOPANTHUS** Raf. Mountain Holly

1. **N. mucronata** (L.) Trel.—Bogs, swamps, pond margins. (H. Mann, Jr., 1862.) Infrequent. (Widely distributed, but not common.)

Family 100. CELASTRACEAE (STAFF-TREE FAMILY)

1. **EUONYMUS** L. Spindle-tree, Euonymus

Key: Man. p.983

2. **E. EUROPÆUS** L., European Spindle-tree.—Roadsides, waste places. (Logermann, 1971.) Rare. (Occasional.) Introduced and naturalized from Europe.
E. ALATUS (Thunb.) Sieb., Winged Euonymus.—Open woods, roadsides, etc. (Eaton #5666 and 5682, 1964.) Occasional. Introduced from eastern Asia and recently spreading from cultivation. The two specimens on which this entry is based were found several hundred meters away from the nearest habitation.

3. CELASTRUS L. Bittersweet, Staff-tree
1. C. scandens L., Climbing Bittersweet — Thickets, stone walls, woods. (Hoar, 1857.) Frequent.

Family 102. ACERACEAE (MAPLE FAMILY)

1. ACER L. Maple

Keys: Man. p.984; Fl. N. E. p.378

- A. GINNALA Maxim.—Roadsides, woods, thickets. (Eaton, 1938.) Uncommon. First discovered in Concord in 1938 in woods on Ripley Mill where well established; four additional localities are now known. Introduced from Asia and now locally naturalized.
3. A. pensylvanicum L., Moosewood, Striped Maple.—Cool, rocky woods. (Deane, 1887.) Rare. (Uncommon, perhaps rare.) Known from a single station, clearly indigenous and still thriving.
- A. CAMPESTRE L., Hedge Maple — Woods. (Eaton, 1955.) Spontaneous from a single mature tree in a woodland plantation. Introduced from Europe.
5. A. saccharum Marsh., Sugar or Rock Maple.—Rich well-drained soils. (Eaton, 11 and 31 May, 10 June 1958.) Rare. (Frequent in western tier of towns of Middl.) Often abundantly spontaneous from introduced specimens. The cited specimens collected from a mature tree 1.2 m in circumference b.h. (breast high) and an obvious descendant of a grove recorded by Minot Pratt (15). Also see Th. J. 4: 221 (7).
8. A. rubrum L. var. rubrum, Red Maple, Swamp Maple.—Woods, usually swampy, river meadows. (Hoar, 1857.) Abundant.
9. A. saccharinum L., River, Silver, White, Soft Maple.—Riverbanks, bottom lands. (Hoar, 1857; 2 April, 18 May 1858.) Common along lower Assabet and Concord rivers. (Frequent along Shawsheen and Charles rivers.)
10. A. NEGUNDO L., Box Elder.—Roadsides, waste land. (Eaton, 1935.) Uncommon. Adventive from farther west.
- A. TARTARICUM L.—Low ground, roadsides. (L. E. Richardson, July, Dec. 1962.) A numerous colony of young trees, obviously spontaneous from a parent cultivated tree. Introduced from Eurasia in 1759, fide Rehder.

Family 105. BALSAMINACEAE (BALSAM FAMILY)

1. IMPATIENS L. Jewelweed, Touch-me-not
2. *I. capensis* Meerb. — Wet or moist shady soil, riverbanks, brooksides. (Hoar, 1857.) Common, often abundant and weedy.

Family 106. RHAMNACEAE (BUCKTHORN FAMILY)

Key: Man. p.992

2. RHAMNUS L. Buckthorn
5. R. FRANGULA L., Alder-Buckthorn. — Low open woods, thickets, borders of meadows. (Brewster, 1918; see Rh. 20: 204.) Common. (Frequent.) Naturalized from Europe recently and spreading very rapidly. The first documented New England record appears to be that of R. C. Bean at Wakefield, Massachusetts, in 1915; the second, G. E. Nichols, New Haven, Connecticut, in 1917. Became well established in several localities in Concord by 1937, and frequent throughout as of 1965, some colonies choking out native vegetation.
3. CEANOTHUS L. Redroot
2. C. americanus L., New Jersey Tea. — Dry, sterile, scrub woods. (Hoar, 1858.) Frequent.

Family 107. VITACEAE (VINE FAMILY)

Key: Man. p.994

1. AMPELOPSIS Michx.
2. A. BREVIPEDUNCULATA (Maxim.) Trautv. — Thickets, openings. (Eaton, 1957.) Occasional. Introduced from Asia.
3. PARTHENOCISSUS Planch. Woodbine, Virginia Creeper
Key: Man. p.995
1. P. quinquefolia (L.) Planch. — Climbing on trees, walls, or trailing. Rock banks, etc. (Eaton, 1935.) Common.
2. P. inserta (Kerner) K. Fritsch. — Thickets, banks, open woods. (Hoar, 1857.) Infrequent.
4. VITIS L. Grape
1. V. Labrusca L., Fox Grape, Common Wild Grape. — Wet and dry thickets, wooded riverbanks, roadsides. (Williams, 1896.) Common.
3. V. aestivalis Michx. var. *argentifolia* (Munson) Fern. —

- Rich open woods and thickets. (Hoar, 1879.) Infrequent. Occurs mostly on the Marlboro Formation.
6. *V. riparia* Michx., Frost Grape.—Rich thickets, shaded riverbanks. (Eaton, 1943: Nos. 5587, 5598, 6638A, all from same station.) Rare in Middl.

Family 108. TILIACEAE (LINDEN FAMILY)

1. *TILIA* L. Basswood, Linden

Key: Man. p.999

1. *T. americana* L., Basswood, Whitewood.—Rich woods, riverbanks. (Eaton, 1920.) Infrequent.
- T. *EUROPAEA* L., European Linden.—Roadsides, rich open woods. (Eaton, 1957.) Occasional. An escape from cultivation, becoming more frequent. Introduced from Europe.

Family 109. MALVACEAE (MALLOW FAMILY)

Key: Man. p.1000

1. *MALVA* L. Mallow

2. *M. NEGLECTA* Wallroth, Common Mallow, Cheeses.—Waste ground. Barnyards, near buildings. (L. E. Richardson, 1958.) Common. Naturalized from Europe.
6. *M. MOSCHATA* L. forma *MOSCHATA*, Musk-Mallow.—Roadsides, waste places, old gardens, etc. (Eaton, 1957.) Infrequent. Naturalized from Europe.

9. *SIDA* L.

2. *S. SPINOSA* L.—Open ground, waste places. (L. E. Richardson, 1970.) Rare. (Uncommon.) Naturalized from the tropics.

12. *HIBISCUS* L. Rose-Mallow

2. *H. palustris* L., Marsh-Mallow, Swamp Rose-Mallow.—Edge of river meadows in Middl. (Hosmer, n.d.; Eaton, 1959.) Rare. Two plants noted in 1969. Swan's specimen of 1880 not necessarily from Concord.

Family 111. GUTTIFERAE (ST. JOHN'S-WORT FAMILY)

2. *HYPERICUM* L. St. John's-wort

Key: Man. p.1008; for highly artificial key see Fl. N. E. p.387.

2. *H. PERFORATUM* L.—Dry fields, roadsides, sandy banks. (Eaton, 1920.) Very common. Naturalized from Europe.

3. *H. punctatum* Lam. — Meadows, shores, swamps, damp openings. (Deane, 1886.) Common.
6. *H. SPATHULATUM* (Spach) Steud. Shrubby St. John's-wort. — Fields, roadsides. (Eaton, 1934.) Rare. Adventive from farther south or west. Abundant at Clam Shell Bluff where obliterated by building developments. See Rh. 38: 64, for this and No. 8 below.
8. *H. DENSIFLORUM* Pursh forma *DENSIFLORUM*. (Eaton, 1934.) Rare. Scattered plants occurred with preceding species and similarly obliterated. Adventive from farther west.
11. *H. ellipticum* Hook. — Damp to wet shores, ditches, meadows, etc. (Perkins, 1880.) Common.
16. *H. boreale* (Britt.) Bickn. — Similar habitats. (Eaton, 1930.) Common.
17. *H. mutilum* L. var. *parviflorum* (Willd.) Fern. — Meadows, shores, low ground. (Hoar, 1887.) Common, sometimes weedy.
19. *H. majus* (Gray) Britt. — Dry or wet, often muddy places. (Thoreau, 1856.) Common. Specimen in Thor. Herb. annotated "Shore Path, Aug. 10, 1856." A Journal entry for this date: "to Fairhaven and Walden."
20. *H. canadense* L. — Wet meadows, shores, or sometimes in dry exsiccated places. (Hoar, 1857.) Frequent.
23. *H. gentianoides* (L.) BSP., Orange-Grass, Pineweed. — Sandy or gravelly soil, road shoulders, etc. (Hoar, 1857.) Common.
24. *H. virginicum* L., Marsh St. John's-wort. — Wet meadows, shores, bogs. (Eaton, 1920.) Common.

Family 112. ELATINACEAE (WATERWORT FAMILY)

1. ELATINE L. Waterwort

Key: Man. p.1015

1. *E. minima* (Nutt.) Fisch. & Mey. — Pond shores, usually submerged in shallow water. (Swan and Jenks, July 1890: "Walden Pond.") Rare. (Infrequent, but widely distributed.)

Family 114. CISTACEAE (ROCKROSE FAMILY)

Key: Man. p.1016

1. HELIANTHEMUM Mill. Rockrose

Key: Man. p.1017

1. **H. canadense** (L.) Michx., Frostweed.—Dry open woods, or dry sandy soil in the open. (Williams, 1896.) Common.
3. **H. Bicknellii** Fern., Frostweed.—Dry rocky, sandy, or argillaceous woods or in the open. (Hoar, 1858.) Frequent.

3. LECHEA L. Pinweed

Key: Man. p.1018

1. **L. villosa** Ell., (*L. mucronata* Raf.).—Dry sandy fields or gravelly scrub woods. (Hoar, 1857.) Common.
3. **L. tenuifolia** Michx.—Dry sandy fields or thin rocky woods. (Hoar, 1857.) Frequent.
5. **L. maritima** Leggett.—Sandy soil in the open. (Hoar, 1857.) Frequent.
8. **L. intermedia** Leggett.—Dry soil in the open. (Hoar, 1857.) Common.

Family 115. VIOLACEAE (VIOLET FAMILY)

2. VIOLA L. Violet

Key to petaliferous flowering material, Man. p.1022; key to cleistogamous or fruiting material, Man. p.1028.

1. **V. pedata** L. var. **lineariloba** DC., Bird-foot Violet.—Dry sunny openings in sandy or argillaceous soils. (Hoar, 1856.) Frequent.
2. **V. cucullata** Ait.—Wet woods, openings and meadows, etc., rich soils about old houses. (Eaton, 1956.) Common, often abundantly weedy. Hybridizes with No. 3 producing:
× **V. Bisselli** House.—Similar habitats. (Eaton, 1956.) Occasional.
3. **V. papilionacea** Pursh.—Meadows, roadsides, damp woods, dooryards, etc. (Eaton, 1922.) Very common. Often weedy.
8. **V. affinis** Le Conte.—Low woods, spaghnum places, shores. (Eaton, 1958.) Rare. (Occasional.)
10. **V. sororia** Willd.—Moist meadows, slopes, low woods, etc. (Eaton, 1956, 1961.) Uncommon. (Frequent.) Hybridizes with No. 11 producing:
× **V. montivaga** House. (Eaton, 1956.) Occasional.

11. *V. septentrionalis* Greene.— Usually low moist woods. (Hoar, 1858.) Common.
15. *V. fimbriatula* Sm.— Dry sterile wood roads, gravelly clearings or pastures, etc. (Hoar, 1858.) Common. (Eaton, 1956, is characterized by white flowers with blue centers; Eaton, 1956, is a putative hybrid between this and No. 11.)
20. *V. Brittoniana* Pollard.— Moist peaty soils. (Hoar, n.d.; Purdie, "5 June"; Eaton, 1921.) Occasional along our river meadows at or near normal high-water line. (Rare elsewhere in Middl.) See p. 26.
30. *V. pallens* (Banks) Brainerd.— Wet or springy woods, shores, wet pastures, etc. (Hoar, 1858.) Common.
31. *V. incognita* Brainerd var. *incognita*.— Damp to wet woods and openings. (H. Mann, Jr., 1862; annotated "E. Brainerd, 1910.") Rare in Middl. Common northward.
— var. *Forbesii* Brainerd. (Eaton, 1957.) Frequent.
32. *V. blanda* Willd.— Rich moist woods. (H. Mann, Jr., n.d.) Rare. (Uncommon.)
34. *V. lanceolata* L.— Open or shady shores, meadows, wet pastures, etc. (Hoar, 1858.) Common.
35. *V. primulifolia* L. var. *primulifolia*.— Similar habitats. (H. Mann, Jr., 1862; determined by Asa Gray.) Rare. (Occasional.)
— var. *acuta* (Bigel.) T. & G. (Eaton 1957.) Uncommon. (Infrequent, but generally distributed.)
40. *V. pubescens* Ait., Downy Yellow Violet.— Rich, usually deciduous woods. (H. Mann, Jr., 1862; annotated A. Gray and E. Brainerd.) Rare. (Uncommon.)
45. *V. conspersa* Reichenb., Dog-Violet.— Damp to wet open woods, clearings, etc. (C. Jarvis, 1823; specimen at U. Mass.; Eaton, 1921.) Uncommon.
49. *V. TRICOLOR* L.— Neglected fields, gardens, dooryards, etc. (Deane, 1893.) Occasional escape from cultivation, sometimes persisting abundantly near old gardens. Introduced from Europe.

Family 121. LYTHRACEAE (LOOSESTRIFE FAMILY)

Key: Man. p.1045

4. *DECODON* J. F. Gmel. Swamp-Loosestrife

1. **D. verticillatus** (L.) Ell. var. *laevigatus* T. & G. — Swamps and shallow ponds. (Eaton, 1957.) Frequent.
5. **LYTHRUM** L. Loosestrife
5. **L. SALICARIA** L. var. **SALICARIA**. — River meadows, swamps. (Eaton, 1958.) Common, often dangerously abundant; rapidly spreading since about 1958 when first noticed in Concord. Naturalized from Europe.

Family 122. NYSSACEAE (SOUR GUM FAMILY)

1. **NYSSA** L. Tupelo, Sour Gum
2. **N. sylvatica** Marsh., Black Gum. — Low woods, swamps, shores. (Hoar, 1857.) Frequent. Because of its habit of growth and autumnal coloration, one of our most beautiful trees.

Family 123. MELASTOMATACEAE (MELASTOMA FAMILY)

1. **RHEXIA** L. Deergrass
3. **R. virginica** L., Meadow-beauty. — Peats, wet sands, and gravels. (Deane, 1886.) Frequent.

Family 124. HYDROCARYACEAE
(WATER-CHESTNUT FAMILY)

1. **TRAPA** L. Water-Chestnut
1. **T. NATANS** L. — Quiet streams and ponds. (Hoar, 1879.) Abundant. Prior to about 1930, a frequent but unaggressive weed in the Sudbury and Concord rivers. Subsequent to a sharp rise in river pollutants in the mid-1930's *Trapa* rapidly became dominant in long stretches of the rivers, sometimes choking the channel. With pesticide control and reduced pollution, now (1974) less troublesome. Naturalized from Eurasia.

Family 125. ONAGRACEAE (EVENING-PRIMROSE FAMILY)

Key: Man. p.1051

2. **LUDWIGIA** L. False Loosestrife
1. **L. alternifolia** L., Seedbox. — Swamps, riverbanks, shores. (Hoar, n.d.; L. E. Richardson, 1963, 1964.) Rare. (Uncommon.) At northeastern limit of range in Middl.
14. **L. palustris** (L.) Ell. var. *americana* (DC.) Fern. & Grisc. — Wet meadows, muddy shores, and stream banks, often submerged. (Williams, 1889.) Common.

3. **EPILOBIUM** L. Willow-herb

Key: Man. p.1055

1. **E. angustifolium** L., Fireweed.—Recent clearings, thickets, recently burned woodlands. (Hoar, 1858.) Common.
6. **E. leptophyllum** Raf.—Wet meadows, swamps, low open ground. (Hoar, 1858.) Infrequent. (Generally distributed.)
12. **E. coloratum** Biehler.—Similar habitats. (Hoar, 1858.) Common.

4. **OENOTHERA** L. Evening-Primrose

Key: Man. p.1063

1. **O. biennis** L. var. **biennis**.—Dry open soil, roadsides, waste places. (Hoar, 1857.) Common.
5. **O. parviflora** L.—Moist gravels, shores and banks. (Eaton, 1961.) Uncommon.
15. **O. perennis** L.—Dry to moist open ground. (H. Mann, Jr., 1862.) Frequent.

5. **GAURA** L. Gaura

1. **G. BIENNIS** L.—Roadsides, fallow fields, waste ground. (Eaton, 1938.) Rare. Adventive from farther west.

7. **CIRCAEA** L. Enchanter's Nightshade

Key: Man. p.1070

1. **C. quadrifida** (Maxim.) Franch. & Sav. var. **canadensis** (L.) Hara.—Rich moist woods, thickets. (Hosmer, n.d.; Eaton, 1958.) Uncommon. (Infrequent, but widely distributed in Middl.) Occasionally weedy about old gardens.
3. **C. alpina** L.—Cool moist woods, shaded springheads. (Hosmer, n.d.; Eaton, 1958, 1960.) Rare. (Infrequent, but widely distributed.)

Family 126. HALORAGACEAE (WATER-MILFOIL FAMILY)

Key: Man. p.1071

1. **MYRIOPHYLLUM** L. Water-Milfoil
9. **M. humile** (Raf.) Morong forma **humile**.—Exposed muds and sands of streams and ponds. (Hoar, 1858.) Frequent.
— forma **capillaceum** (Torr.) Fern.—Submerged in ponds and slow streams. (Deane, 1886.) Common, often abundant.

2. PROSERPINACA L. Mermaid-weed

Key: Man. p.1075

1. **P. palustris** L. var. **palustris**.—Shores and shallow water of ponds, slow streams. (Hosmer, n.d.; Eaton, 1957.) Rare and local.
— var. **crebra** Fern. & Grisc.—Shores, muds, and shallow water of ponds and streams. (Deane, 1886.) Common. For key to vars. see Man. p. 1076.

Family 128. ARALIACEAE (GINSENG FAMILY)

Key: Man. p.1077

1. ARALIA L.

Key: Man. p.1077

2. **A. racemosa** L., Spikenard.—Rich woods and thickets. (Hosmer, n.d.; Eaton, 1958.) Rare. (Infrequent, but widely distributed.)
3. **A. hispida** Vent., Bristly Sarsaparilla.—Dry sandy and rocky woods and clearings. (Eaton, 1922.) Frequent.
4. **A. nudicaulis** L., Wild Sarsaparilla.—Woodlands, dry or moist. (Hoar, 1858.) Very common, often abundant.

Family 129. UMBELLIFERAE (PARSLEY FAMILY)

Artificial key to the genera based on superficial characters, Man. p.1081. For a key with excellent illustrations of fruit of certain species, see Fl. N. E., pl. 409.

1. HYDROCOTYLE L. Water-Pennywort

Key: Man. p.1087

5. **H. americana** L.—Wet meadows, banks of streams, shores. (Eaton, 1920.) Common. [Thor.]

3. SANICULA L. Black Snakeroot

1. **S. marilandica** L.—Open, commonly dry woods and thickets. (Hoar, 1858.) Uncommon. (Frequent.) [Thor.]

7. OSMORHIZA Raf. Sweet Cicely

Key: Man. p.1092

2. **O. longistylis** (Torr.) DC., Anise-root.—Rich, often alluvial woods and thickets. (Hosmer, n.d.) Rare, not seen in recent years. (Uncommon, but known from six towns in Middl.)

15. ZIZIA W.D.J. Koch

3. **Z. aurea** (L.) W.D.J. Koch.—Wet meadows, shores, swampy open woods. (Lund, n.d.) Common.

16. CICUTA L. Water-Hemlock

Key: Man. p.1095

1. *C. bulbifera* L.—Wet river meadows, swamps, wet thickets. (Hoar, 1857.) Common. [Thor.]
2. *C. maculata* L., Spotted Cowbane.—Wet meadows, swamps, shores. (Hoar, 1857.) Common. Tuber-like roots, with the odor of parsnips, are reputedly deadly poisonous. [Thor.]

19. CARUM L. Caraway

1. *C. CARVI* L., Caraway.—Fields, roadsides, waste places. (Thor. Herb., n.c.d.) Uncommon? (Frequent.) Naturalized from Europe. This specimen is accepted as from Concord, the plant being frequent in eastern Middl.

22. AEGOPODIUM L. Goutweed

1. *A. PODAGRARIA* L.—Moist to dry fields, roadsides, old dooryards, etc. (Eaton, 1958.) Still uncommon. Naturalized from Europe. Often a troublesome, pernicious weed in good soils.

24. SIUM L. Water-parsnip

1. *S. suave* Walt.—Wet meadows, wet thickets, muddy shores. (Hoar, 1857.) Common.

PEUCEDANUM L.

A genus not recorded in the Man.

- P. *PALUSTRE* Moench forma *PALUSTRE*.—Stream borders, moist to wet meadows, etc. (L. E. Richardson, 1970.) Rare; a single abundant colony along a brook crossing Liberty Street near Flint's Bridge. This collection appears to match the description in Clapham, Tutin and Warburg (37), particularly in respect to "the lanceolate acuminate bracteoles (involucels) equal or shorter than the minutely pubescent or rough pedicels." Adventive from Old World.

— forma (undescribed).—Edge of dyke at Great Meadows impoundments. (L. E. Richardson, 1970.) This plant appears to match S. K. Harris #18059, West Newbury, Essex Co., Massachusetts, 9 July 1958, which constitutes the first record I can find for the species for the Gray's Manual range. The ultimate divisions of the leaflets are much coarser and average about 2 mm wider than forma *palustre*, and the involucels are long-acuminate, much exceeding the

pedicels (up to twice as long). Possibly deserves varietal rank.

36. ANGELICA L. Angelica

4. A. ATROPURPUREA L.—River and brook meadows, rich bottomlands. (Swan, 1889.) Rare. (Uncommon.) Naturalized from Europe. [Thor.]

43. PASTINACA L. Parsnip

1. P. SATIVA L.—Moist to dry fields, roadsides, wastelands. (Thor. Herb., n.c.d.) Scarce. (Frequent.) Naturalized from Europe. Specimen accepted as from Concord, the plant being frequent in Middl.

45. DAUCUS L. Carrot

1. D. CAROTA L., Wild Carrot, Queen Anne's Lace.—Fields, roadsides, waste places. (Hoar, 1888.) Abundant. A pernicious weed. Naturalized from Europe. [Thor.]

Family 130. CORNACEAE (DOGWOOD FAMILY)

1. CORNUS L. Dogwood, Cornel

Key: Man. p.1105

1. C. canadensis L., Dwarf Cornel, Bunchberry.—Woods, openings, usually damp ground. (Hoar, 1858.) Frequent. [Thor.]
3. C. florida L., Flowering Dogwood.—Acidic woods. (H. Mann, Jr., n.d.; Eaton, 1955.) Rare. (Uncommon.) [Thor.]
4. C. stolonifera Michx., Red Osier.—Low thickets, shores. (Kennedy, 1913.) Infrequent, but occasionally abundant. [Thor.]
6. C. rugosa Lam., Round-leaved Dogwood.—Thickets and borders of woods on sweet soil. (H. Mann, Jr., 1862.) Infrequent. [Thor.]
9. C. Amomum Mill.—Swampy river meadows, damp or rarely dry thickets. (Eaton, 1930.) Common. [Thor.]
10. C. obliqua Raf., Silky Dogwood.—Similar habitats. (Eaton and Richardson, 1958.) Uncommon.
11. C. racemosa Lam.—Moist to dryish thickets and openings. (Eaton, 1935.) Common. [Thor.]
12. C. alternifolia L. f.—Borders of woods and thickets, usually dry. (Eaton, 1935.) Frequent. [Thor.]

Subclass II. METACHLAMYDEAE (Gamopetalae)

Family 131. CLETHRACEAE (WHITE ALDER FAMILY)

1. CLETHRA L. Clethra

1. **C. alnifolia** L., Clethra, Sweet Pepperbush.—Low to swampy woods and thickets. (Eaton, 1935.) Common, often abundant. [Thor.]

Family 132. PYROLACEAE (WINTERGREEN FAMILY)

Key: Man. p.1108

1. CHIMAPHILA Pursh Pipsissewa, Wintergreen

1. **C. umbellata** (L.) Bart. var. *cisatlantica* Blake.—Dry woods. (Eaton, 1920.) Common. [Thor.]
2. **C. maculata** (L.) Pursh, Spotted Wintergreen.—Dry woods. (Lund, n.d.; Hosmer, n.d.; Eaton, 1956.) Occasional. A specimen in Thor. Herb. annotated "Goose Pond," hence from Concord.

2. MONESES Salisb. One-flowered Pyrola

1. **M. uniflora** (L.) Gray.—Cool, often evergreen woods. (Lund, n.d.; Eaton, 1921; E. Anderson and Eaton, 1964.) Rare. Formerly abundant on summit of Annursnack Hill, now reduced to a small colony; also a few plants discovered by Mrs. Esther Anderson in woods off Garfield Road.

3. PYROLA L. Pyrola, Shinleaf

Key: Man. p.1110

1. **P. secunda** L. var. *secunda*, One-sided Pyrola.—Dry or moist woods. (C. Jarvis, 1835: specimen at U. Mass; Eaton, 1935.) Uncommon. [Thor.]

4. **P. virens** Schweigger var. *virens*.—Dryish, mostly coniferous woods. (Swan, 1890.) Occasional.

— var. *convoluta* (Bart.) Fern.—Dry woods. (Hoar, 1857; ex Herb. Perkins, 1880.) Uncommon. [Thor.]

5. **P. elliptica** Nutt., Shinleaf, Wild Lily-of-the-valley.—Dry or moist woods. (H. Mann, Jr., 1862.) Common. [Thor.]

6. **P. rotundifolia** L. var. *americana* (Sweet) Fern.—Woods and clearings. (Hoar, 1857.) Common. [Thor.]

4. MONOTROPA L. Indian-pipe, Pinesap

Key: Man. p.1113

1. **M. uniflora** L., Indian-pipe.—Woodland leaf-mold and humus. (Eaton, 1922.) Common. [Thor.]

2. **M. Hypopithys** L., Pinesap.—Similar habitat. (Eaton, 1938.) Infrequent. [Thor.]

Family 133. ERICACEAE (HEATH FAMILY)

Key to genera, Man. p.1114; for a helpful artificial key to the New England genera, see Fl. N. E. p.427.

1. **LEDUM** L. Labrador-tea

1. **L. groenlandicum** Oeder.—Peats, sphagnous swamps and bogs. (Hoar, 1858; Eaton, Dec. 1921; Thor. Herb.) Rare. A single station, now destroyed, which constituted the extreme southeast limit of range for the species in New England. (For an account of its discovery by Thoreau, see Th. J. 10: 273, 4 Feb. 1858.)

2. **RHODODENDRON** L. Rhododendron, Rosebay, Azalea
Key: Man. p.1116

4. **R. canadense** (L.) Torr., Rhodora.—Peaty shores, bogs and swamps. (Hoar, 1858.) Occasional. [Thor.] Immortalized in a poem by Ralph Waldo Emerson.

7. **R. roseum** (Loisel.) Rehd., Pink Azalea, Pink Honeysuckle.—Dry woods and openings. (Hoar, 1858.) A single colony that still persists, formerly showy when in bloom, now too deeply shaded. [Thor.] See Th. J. 5: 204-208 for an account of his wheedling Melvin into telling him where it grew, and of its exceptional beauty and fragrance. It was named *Azalea nudiflorum* by Hoar and Thoreau.

10. **R. viscosum** (L.) Torr. forma **viscosum**, Swamp-Honeysuckle, White Azalea.—Bogs, pond shores, borders of river meadows and damp clearings. (Hoar, 1857.) Frequent. [Thor.]

— forma **glaucum** (Lam.) Voss.—Similar habitats, mostly in sphagnum bogs. (Eaton, 1930.) Occasional.

6. **KALMIA** L. Laurel (of America)

Key: Man. p.1121

1. **K. latifolia** L., Mountain Laurel.—Woods, clearings, rocky banks, on acid soil. (Hoar, 1858.) Infrequent. Scattered plants or small colonies, chiefly on or in the vicinity of the five hills. [Thor.]

2. **K. angustifolia** L., Sheep Laurel, Lambkill.—Dry or wet

- sterile soil, old pastures, scrub oak woods, etc. (Eaton, 1920.) Common. [Thor.]
3. **K. polifolia** Wang., Pale or Bog Laurel.—Sphagnum bogs, peats. (Hoar, 1858.) Occasional; four stations. Specimen in Thor. Herb. annotated "Maine Woods '53."

8. ANDROMEDA L. Andromeda

1. **A. glaucophylla** Link, Bog-Rosemary.—Cold sphagnum bogs. (A. Hicks, 1885; Eaton, 1920.) Rare and local, two stations. [Thor.]

11. LYONIA Nutt.

3. **L. ligustrina** (L.) DC., Maleberry.—Bogs, peaty swamps and thickets. (Hoar, 1857.) Frequent. [Thor.]

12. LEUCOTHOË D. Don Fetter-bush

4. **L. racemosa** (L.) Gray.—Pond shores, moist thickets, bogs. (Hosmer, n.d.) Rare. (Uncommon, but specimens from ten towns in Middl.) Not seen in recent years. Reported by Thoreau from "Island" (=Egg Rock) in Th. J. 9: 400. [Thor.]

14. CHAMAEDAPHNE Moench Cassandra, Leather-leaf

1. **C. calyculata** (L.) Moench var. **angustifolia** (Ait.) Rehd.—Swamps, bogs, peaty river meadows. (Hoar, 1858.) Common. [Thor.]

16. EPIGAEA L. Trailing Arbutus

1. **E. repens** L. var. **glabrifolia** Fern.—Dry to moist woods and banks on acid soils. (Hoar, 1858.) Rare. Now known from a single station where threatened by road improvements; formerly on Fairhaven Hill (Th. J. 10: 276); "near the Marlboro Road" (Hoar's label); east bank of Warner's Pond (fide Eaton). Thriving colonies in the vicinity of Goose Pond were introduced (fide Eaton). Specimen in Thor. Herb. annotated "Brattleboro—Mrs. Brown" (n.d.).

17. GAULTHERIA L. Aromatic Wintergreen

1. **G. procumbens** L. forma **procumbens**, Checkerberry.—Sterile or moist woods on acid soil. (L. E. Richardson, 1964.) Common. [Thor.]

— forma **suborbiculata** Fern. (G. Buttrick, 1895.) Apparently rare.

18. ARCTOSTAPHYLOS Adans. Bearberry

1. A. *Uva-ursi* (L.) Spreng. var. *coactilis* Fern. & Macbr.— Exposed rocks, crests, sandy open woods. (Hoar, 1858.) Rare. (Infrequent in Middl.) Hoar's specimen is annotated "Cliffs," where it still persisted in 1972. [Thor.] Abundant on Cranberry Hill, Lincoln.

21. GAYLUSSACIA HBK. Huckleberry

Key: Man. p.1128

2. G. *dumosa* (Andr.) T. & G. var. *Bigeloviana* Fern.— Sphagnous bogs and swamps. (C. C. Field, 1835; H. Mann, Jr., 1862.) Rare, not seen in recent years. Field's specimen is at U. Mass. and annotated "S. east of the Poor House." Thoreau records it from Gowing's Swamp (Th. J. 9: 41) and from Ledum Bog (*ibid.*, 11: 83). His specimen is annotated "Gowing's Swamp" but n.d. The plant is local in Massachusetts with no collections seen west of Littleton.
3. G. *frondosa* (L.) T. & G., Dangleberry.— Dry or wet woods, clearings, old pastures, sphagnum bogs. (Hoar, 1858.) Occasional. Abundant at Gowing's Swamp. (Frequent.) [Thor.]
4. G. *baccata* (Wang.) K. Koch forma *baccata*, Black Huckleberry.— Dry or moist woods, clearings, old pastures. (Hoar, 1858; Thoreau, "behind Pratt's," n.d.) Common, often abundant.

22. VACCINIUM L. Blueberry, Cranberry

Key: Man. p.1129

12. V. *vacillans* Torr., Sugar Huckleberry.— Dry, often sterile open woods and clearings, old pastures. (Hoar, 1858.) Common.
13. V. *angustifolium* Ait. var. *laevifolium* House, Low or Late Sweet Blueberry.— Dry peats, rocks or damp sphagnous open places. (Eaton, 1930.) Frequent. Often occurring as dominant on areas of several square meters. [Thor.]
14. V. *corymbosum* L. var. *corymbosum*, Highbush Blueberry.— Bogs, swamps, shores, or even dry uplands. (H. Mann, Jr., 1862.) Frequent. Occasionally abundant as at Gowing's Swamp. [Thor.]
— var. *glabrum* Gray. (Eaton, 1922.) Occasional, perhaps frequent.

16. *V. atrococcum* (Gray) Heller, Black Highbush Blueberry.
— Habitats similar to No. 14. (Eaton, 1917.) Frequent. Blooms 7–10 days earlier than No. 14. [Thor.]
20. *V. Oxyccocos* L., Small Cranberry.— Sphagnum bogs (in Middl.). (Eaton, 1921.) Rare; two stations. [Thor.]
21. *V. macrocarpon* Ait. forma *macrocarpon*, Large or American Cranberry.— River meadows, swamps, bogs. (Batchelder, 1885.) Common, often abundant. [Thor.]
— forma *microcarpon*, an unpublished form known from two other localities. Bogs. (Eaton, 1967.) Leaves crowded, averaging 8 per cm of new growth, (5–)7.5 (–10) mm long, (2.5–)3(–4) mm wide; berries 0.95–1.1 cm long (av. 0.98), 0.94–0.99 cm thick, measurements by calipers from 22 random fruits. Rare. Forming dense turf-like clones.

Family 135. PRIMULACEAE (PRIMROSE FAMILY)

Key: Man. p.1136

4. *LYSIMACHIA* L. Loosestrife

Key: Man. p.1139

3. *L. quadrifolia* L., Whorled Loosestrife.— Dry or moist open woods, thickets and shores. (Hoar, 1857.) Common. [Thor.]
5. *L. terrestris* (L.) BSP., Swamp-Loosestrife, Swamp-candles.— River meadows, wet shores, swampy places. (Hoar, 1857.) Common. [Thor.]
6. *L. NUMMULARIA* L., Moneywort.— Moist roadside banks, ditches, moist shaded soils. (Hoar, 1890.) Occasional. Naturalized from Europe.
7. *L. thrysiflora* L., Tufted Loosestrife.— River meadows near springy places, cold swamps and bogs. (Eaton, 1959.) Uncommon. Reported from thirteen towns in Middl. [Thor.] Mentioned as growing in Calla Swamp in Th. J. 9: 411.
12. *L. hybrida* Michx.— River meadows, swamps, shores. (Hoar, 1858.) Common. [Thor.]

5. *TRIENTALIS* L.

1. *T. borealis* Raf., Star-flower.— Dry to damp woods. (Hoar, 1858.) Common. [Thor.]

6. *ANAGALLIS* L. Pimpernel

1. *A. ARVENSIS* L., Scarlet Pimpernel.— Sandy fields, waste

ground, dooryards. (Hoar, 1891.) Occasional. Naturalized from Europe. Thoreau's specimen annotated "Truro '50."

Family 141. OLEACEAE (OLIVE FAMILY)

1. FRAXINUS L. Ash

Key: Man. p.1147

1. **F. americana** L. forma **americana**, White Ash.—Rich upland or lowland woods, roadsides. (Eaton, 1935.) Frequent, occasionally abundant.
____ forma **iodocarpa** Fern. (Eaton, 1966.) Uncommon.
3. **F. pensylvanica** Marsh. var. **pensylvanica**, Red Ash.—Low woods, stream banks. (Eaton, 1964.) Occasional.
____ var. **Austini** Fern. (Deane, 1886.) Occasional.
6. **F. nigra** Marsh., Black Ash.—Swamps, stream banks, and shores. (Hoar, "20 Sept."; Deane, 1886; Eaton, 1955.) Rare. (Infrequent.) Deane annotated his specimen "in abundant fruit."

2. SYRINGA L. Lilac

1. **S. VULGARIS** L., Lilac. Near former dwellings, roadsides. (Eaton, 1935.) Occasional. Escaped from cultivation. Naturalized from Europe.

FORSYTHIA Vahl

1. **F. SUSPENSA** (Thunb.) Vahl var. **SUSPENSA**.—Roadsides, thickets, open woods, near old dwellings. (Eaton and Logermann, 1970.) Rare. Escaped from cultivation and naturalized from Asia. This specimen from an obviously spontaneous plant.
____ var. **FORTUNEI** (Lindl.) Rehd.—Roadsides, near old dwellings. (Eaton, 1958.) Rare. Escaped from cultivation. Introduced from Asia. The plant cited here growing on talus of ledge in deciduous woods, thoroughly naturalized and seemingly spontaneous.

Family 143. GENTIANACEAE (GENTIAN FAMILY)

Key: Man. p.1153

2. CENTAURIUM Hill Centaury

2. **C. UMBELLATUM** Gilib., Centaury. (H. S. Richardson, 1890; A. W. Hosmer, n.d.) Rare. Local in New England. Naturalized from Europe.

3. GENTIANA L. Gentian

Key: Man. p.1157

1. **G. crinita** Froel., Fringed Gentian.— Brook-meadows, ditch-banks, low brushy ground and wet thickets. (Williams, 1896.) Occasional. Often transient at a station and rarely transiently abundant. [Thor.]
14. **G. Andrewssii** Griseb., Closed or Bottle-Gentian.— Wet brook-meadows, ditch-banks, low shrubby ground. (Hoar, 1858.) Rare. Known presently from two stations where endangered. Reaches northeastern limit of range in eastern Massachusetts. [Thor.]
16. **G. clausa** Raf., Closed or Bottle-Gentian.— Stream and ditchbanks, borders of low woods and thickets. (Williams, 1897, "along Lowell R.R. ditch" where in 1969 it still persisted.) Occasional. [Thor.] One of the several specimens in the Thor. Herb. is this species which Thoreau did not distinguish from No. 14.

7. BARTONIA Muhl.

1. **B. virginica** (L.) BSP.— Peaty meadows, shores, wet or dry acid soils. (Eaton, 1922.) Frequent. [Thor.]
2. **B. paniculata** (Michx.) Muhl.— Sandy shores and wet peats. (Eaton, 1957.) Rare. Known in Middl. from a single sparse station.

9. MENYANTHES L. Buckbean

1. **M. trifoliata** L. var. **minor** Raf.— Sphagnum bogs. (Hoar, 5 June: "Foot of Nusneck [sic], wet meadows.") Rare. Formerly occurred in at least three stations and abundantly at one of them; now known from a single station where sparse. Thoreau mentions it as occurring in Gowing's Swamp (Th. J. 9: 44) where not seen in recent years. [Thor.]

10. NYMPHOIDES Hill Floating-heart

Key: Man. p.1166

1. **N. cordata** (Ell.) Fern.— Ponds or slow streams. (Brewster, 1893.) Locally frequent and formerly abundant in now heavily polluted river. (Infrequent elsewhere in Middl.) [Thor.]

Family 144. APOCYNACEAE (DOGBANE FAMILY)

Key: Man. p.1167

2. VINCA L. Periwinkle

1. *V. MINOR* L., Common Periwinkle, "Myrtle." — Open woods, shaded roadsides, near buildings, etc. (Eaton, 1957.) Occasional. Locally abundant as an escape from cultivation. Naturalized from Europe.

4. APOCYNUM L. Dogbane, Indian Hemp

Key: Man. p.1168

1. *A. androsaemifolium* L.— Dry open places, roadsides, borders of woods. (Hoar, 1858.) Common. [Thor.]
2. *A. medium* Greene.— Similar habitats, often in sterile gravels, etc. (Eaton, 1957.) Uncommon. Seldom collected in Middl.
3. *A. cannabinum* L., Indian Hemp.— Moist or dry open places, roadsides, shores, etc. (Thoreau, 1856; Eaton, 1953, 1959.) Uncommon. Thoreau records finding and collecting the plant on 5 Aug. 1856 "at the Assabet stone bridge," and on the Island (Egg Rock) on 9 Aug. 1856 (Th. J. 8: 447; 8: 458). It is of interest that Eaton's specimen was collected near a stone bridge over the Assabet River on Main Street, W. Concord. [Thor.]

Family 145. ASCLEPIADACEAE (MILKWEED FAMILY)

Key: Man. p.1169

2. ASCLEPIAS L. Milkweed

1. *A. tuberosa* L., Butterfly-weed, Pleurisy-root. Dry open soil. (Eaton, 1929; 1937.) Rare. The only records in Middl. except Westford, at northeastern limit of range. The Concord plants were found about a mile apart near the Concord River southeast and southwest of Punkatasset Hill.
4. *A. purpurascens* L., Purple Milkweed.— Dry to damp woods, openings, thickets. (Eaton, 1957.) Rare. Estabrook Woods.
5. *A. incarnata* L. var. *pulchra* (Ehrh.) Pers., Swamp Milkweed.— River meadows, swamps, shores. (Hoar, 1886.) Common. [Thor.]
8. *A. exaltata* L.— Rich woods and clearings. (Eaton, 1957.) Infrequent, but widely distributed in Middl. Estabrook Woods. [Thor.]
14. *A. syriaca* L., Common Milkweed.— Dry to moist fields,

roadsides, thickets. (Eaton, 1957.) Common, often weedy and troublesome. [Thor.]

16. A. **amplexicaulis** Sm.—Dry sandy soil in fields and borders of woods. (Hoar, 1857.) Frequent. [Thor.]
18. A. **verticillata** L., Whorled Milkweed.—Dry open, often sterile woods. (Hoar, 1879.) Rare. A single station near northeastern limit of range. Not seen since 1962. Overlooked by Thoreau; over-collected by 19th century botanists.

4. CYNANCHUM L.

1. C. **nigrum** (L.) Pers.—Fields, roadsides, thickets, etc. (Hosmer, n.d.; Eaton, 1934.) Infrequent. An aggressive weed locally on Cape Cod. Naturalized from Europe.

Family 146. CONVOLVULACEAE (CONVOLVULUS FAMILY)

Key: Man. p.1177

6. CONVOLVULUS L. Bindweed

Key: Man. p.1180

2. C. **sepium** L., Wild Morning-Glory, Hedge Bindweed.—Thickets, meadows, moist fields. (Eaton, 1920.) Frequent. Often a troublesome weed in cultivated ground. [Thor.]
4. C. **PELLITUS** Ledeb. forma **ANESTIUS** Fern.—Roadsides, fallow fields, waste places. (Deane & Manning, 1884.) Introduced from Asia and a rare escape from cultivation.
5. C. **ARVENTIS** L., Field Bindweed.—Old fields and waste places. (Eaton, 1961.) Uncommon. Naturalized from Eurasia. [Thor.]

7. CUSCUTA L. Dodder

Key: Man. p.1182

1. C. **Polygonorum** Engelm.—Parasite on *Polygonum*, *Lycopus*, *Penthorum* and other herbs of low open ground. (Eaton, 1930.) Very rare. Known from two other stations in New England (Rhode Island and Connecticut).
7. C. **Gronovii** Willd.—Low ground. Parasitic on very many hosts, chiefly herbs, rarely on *Rubus*. (Hoar, 1858.) Common. [Thor.]
— var. **latiflora** Engelm.—Similar habitats. (Eaton, 1957.) Common. Specimen determined by T. G. Yuncker, but var. not recognized by Fernald in Man.

11. *C. compacta* Juss.—On a great variety of shrubs and coarse herbs in river meadows and low thickets. (Eaton, 1928.) Rare. At northeastern limit of range in Middl.

Family 147. POLEMONIACEAE (POLEMONIUM FAMILY)

Key: Man. p.1186

1. *POLEMONIUM* L. Jacob's-ladder
4. *P. REPTANS* L.—Moist open soils. (L. E. Richardson, 1970.) Rare. Introduced from farther west and south. Escaped from cultivation.

Family 149. BORAGINACEAE (BORAGE FAMILY)

Key: Man. p.1195. For an artificial key to the genera, see Fl. N. E. p.452.

7. *ECHIUM* L. Viper's Bugloss

1. *E. VULGARE* L. var. *VULGARE*.—Roadsides, dry fields, waste places. (Eaton, 1934.) Uncommon. (Frequent.) Often abundantly weedy in rich or limestone soils. Naturalized from Europe.
— var. *PUSTULATUM* (Sibth. & Sm.) Coincy. (Eaton, 1957.) Rare. Adventive from Europe, probably via the midwest. See Rh. 38: 64 (1936).

11. *MYOSOTIS* L. Forget-me-not

Key: Man. p.1203

1. *M. SCORPIOIDES* L., True Forget-me-not.—Brooks, springy ground, quiet water. (Eaton, 1958.) Frequent. Naturalized from Europe.
2. *M. laxa* Lehm.—Similar habitats. (Eaton, 1921.) Infrequent. (Frequent.) [Thor.]
3. *M. verna* Nutt.—Dry rocky woods and ledges; dry or moist banks. (Eaton, 1932.) Uncommon. [Thor.]

17. *HACKELIA* Opiz Stickseed, Beggar's-lice

1. *H. virginiana* (L.) I. M. Johnston.—Rich open woods. (C. Jarvis, n.d.) Rare. (Occasional: specimens from seven towns in Middl.) The Jarvis specimen is among those Jarvis collected in Concord between 1830 and 1838 and is to be found in U. Mass.

Family 150. VERBENACEAE (VERVAIN FAMILY)

1. *VERBENA* L. Vervain, Verbena

Key: Man. p.1208

5. *V. urticifolia* L., White Vervain.—Thickets, borders of ditches, well-drained meadows, etc. (Hoar, 1857.) Common. [Thor.]
6. *V. hastata* L., Blue Vervain.—Damp thickets, shores, swales. (Hoar, 1857.) Common. [Thor.]
8. *V. STRICTA* Vent., Hoary Verbena.—Dry fields. (Eaton, 1934.) Rare. Adventive from the west. See Rh. 38: 64 (1936). A few plants present in 1957.
10. *V. BRACTEATA* Lag. & Rodr.—Sandy fields and waste places. (Eaton, 1961.) Rare. (Occasional.) Adventive from farther west and south.

Family 151. LABIATAE (MINT FAMILY)

Key: Man. p.1213. For artificial key to New England genera, see Fl. N. E. p.457.

2. TRICHOSTEMA L.

1. *T. dichotomum* L., Bluecurls, Bastard Pennyroyal.—Dry open, often sandy, sterile soil. (Hoar, 1857.) Common. [Thor.]

3. AJUGA L. Bugleweed

1. A. *REPTANS* L.—Shaded ground, lawns, yards, etc. (L. E. Richardson, 1970.) Locally abundant. (Uncommon.) Introduced and naturalized from Europe.

4. TEUCRIUM L. Germander

1. *T. canadense* L. var. *virginicum* (L.) Eat.—Wet woods, ditch banks, rich low thickets. (Eaton, 1957.) Uncommon. This var. also found in 1971 in an Assabet River meadow, and abundantly on a shady edge of a roadside thicket on Fairhaven Road.

6. SCUTELLARIA L. Skullcap

Key: Man. p.1218

9. *S. lateriflora* L., Mad-dog Skulcap.—River meadows, shores, swampy open woods. (Hoar, 1858.) Common. [Thor.]
10. *S. epilobiifolia* A. Hamilton, Common Skulcap.—Similar habitats. (Eaton, 1930.) Common. [Thor.]

10. NEPETA L. Catmint

1. *N. CATARIA* L., Catnip.—Dooryards of former dwellings, roadsides, waste places. (Hoar, 1858.) Uncommon. (Frequent.) Naturalized from Europe. [Thor.]

11. GLECHOMA L. Ground-Ivy

1. G. HEDERACEA L., Gill-over-the-ground. — Damp open or shady places, yards, neglected lawns and shrubberies, etc. (Hoar, 1890.) Common, often a troublesome weed. Includes var. *micrantha* Moricand. Peter S. Green has shown this species to be dimorphic. Naturalized from Europe. [Thor.]

13. PRUNELLA L. Selfheal

Key: Man. p.1225

1. P. VULGARIS L. var. VULGARIS, Heal-all. — Grasslands, roadsides, wood-roads, waste places. (Eaton, 1957.) Uncommon. Naturalized from Eurasia.
— var. *lanceolata* (Bart.) Fern. — Similar habitats. (Hoar, 1857.) Common. Indigenous. [Thor.]

17. LEONURUS L. Motherwort

1. L. CARDIACA L., Common Motherwort. — Waste places, fallow fields, orchards, etc. (L. E. Richardson, 1966.) Casual. (Uncommon.) Naturalized from Europe.

19. LAMIUM L. Dead-Nettle

1. L. AMPLEXICAULE L., Henbit. — Waste places, fallow fields, orchards, etc. (L. E. Richardson, 1966.) Casual. (Uncommon.) Naturalized from Europe.
3. L. PURPUREUM L., Purple Dead-Nettle. — Fallow fields, waste places, cultivated soils. (L. E. Richardson, 18 May 1974: abundant in a fallow field within an area of at least 30 square meters. Station discovered by Rosita Corey.) Rare. Naturalized from Europe.

20. STACHYS L. Hedge-Nettle

Key: Man. p.1230

5. S. PALUSTRIS L. var. ELLIPTICA Clos, Woundwort. — Shores, fields, waste places. (Eaton, 1969.) Apparently rare. Abundant in fallow field near mouth of Spencer Brook. Naturalized from Europe. [Thor.]

22. MONARDA L. Horsemint

Key: Man. p.1236

1. M. DIDYMA L., Bee-balm, Oswego-tea. — Rich thickets, roadsides, near former dwellings. (Hoar, 1879.) Uncommon. Escaped from cultivation or adventive from farther west.

3. *M. MEDIA* Willd. — Similar habitats. (Hoar, 1879.) Occasional. Escaped from cultivation. Introduced from farther west.
6. *M. FISTULOSA* L. var. *FISTULOSA*. — Fallow fields, roadsides, rich waste ground. (Thoreau, 1854.) Uncommon. Specimen in Thor. Herb. and annotated "Smith's Road July 18, '54" (see Th. J. 6: 403). Introduced from farther west.
— var. *MOLLIS* (L.) Benth., Wild Bergamot. — Similar habitats. (Thoreau, 1856; Hosmer, n.d.; Eaton, 1934.) Occasional. Still abundant at the Concord station in 1957 where adventive from farther west. (See Rh. 38: 64–67.) The Thoreau specimen in Thor. Herb. and annotated "Aug. 16, 1856" (see Th. J. 9: 4).

24. *HEDEOMA* Pers. Mock Pennyroyal

1. *H. pulegioides* (L.) Pers., American Pennyroyal. — Dry rocky woods, fields, old pastures. (Eaton, 1958.) Infrequent, but abundant on the Marlboro Formation at Conantum.
29. *PYCNANTHEMUM* Michx. Mountain Mint, Basil
Key: Man. p.1241
4. *P. tenuifolium* Schrad. — Dry to moist fields, thickets. (Deane, 1903.) Infrequent.
6. *P. virginianum* (L.) Durand & Jackson. — Meadows, stream banks, gravelly shores. (Williams, 1896.) Frequent.
8. *P. PILOSUM* Nutt. — Dry to moist fields, thickets and clearings. (Eaton, 1934.) Rare. Well established in fallow field where doubtless adventive from farther west. (See Rh. 38: 64–67.)
9. *P. muticum* (Michx.) Pers. — Dry thickets, clearings, thin woods. (Hoar, n.d.) Common. [Thor.]
10. *P. clinopodioides* T. & G. — Dry to moist wooded slopes, thickets, and shores. (Purdie, 1889, ex Herb. T. Otis Fuller, the label in Fuller's handwriting and annotated "collected by H. A. Purdie.") Rare and local, at north-eastern limit of range in Middl.
13. *P. incanum* (L.) Michx. — Similar habitats. (Hoar, "Oct. Dry gravel about base of Nusneck.") Infrequent. (Widely distributed in Middl.) [Thor.]

31. THYMUS L. Thyme

1. T. PULEGIOIDES L., (*T. serpyllum* L. of Man.), Wild Thyme.
— Dry fields, turfs, and open sterile soils. (Eaton, 1957.) Rare. (Uncommon.) Adventive and naturalized from Europe.

33. LYCOPUS L. Water-Horehound

Key: Man. p.1246

1. L. virginicus L.— Riverbanks, pond shores, meadows, low ground. (Hoar, 1888.) Common.
2. L. uniflorus Michx.— Similar habitats. (Eaton, 1961.) Frequent.
4. L. americanus Muhl.— Similar habitats. (Eaton, 1932.) Frequent.

34. MENTHA L. Mint

Key: Man. p.1248

4. M. SPICATA L., Spearmint.— Wet places. (Rodman, 1911.) Uncommon. Introduced from Europe and naturalized.
5. M. PIPERITA L., Peppermint.— Ditches, wet meadows, open wet places. (Thoreau, n.d.) Specimen annotated "Hosmer's ditch." Introduced from Europe.
11. M. arvensis L. var. arvensis, Mint.— Damp open soil, shores, etc. (Eaton, 1961.) Frequent. Our only indigenous species.
— var. *villosa* (Benth.) S. R. Stewart. (Hoar, 1857.) Common. [Thor.]
— forma *glabrata* (Benth.) S. R. Stewart. (Eaton, 1957.) Frequent.

Family 152. SOLANACEAE (NIGHTSHADE FAMILY)

Key: Man. p.1251

1. SOLANUM L. Nightshade

Key: Man. p.1252

1. S. DULCAMARA L., Nightshade.— Thickets, shrubberies, moist soil near dwellings. (Eaton, 1921.) Common, often weedy. [Thor.] Introduced from Europe.
4. S. americanum Mill.— Dry open woods, openings, shores, often spreading as weeds to barnyards and cultivated ground. (Eaton, 1959.) Infrequent; locally abundant as a weed.

8. **S. CAROLINENSE** L., Horse-nettle.—Moist or dry sandy fields, old orchards, waste places. (Eaton, 1929.) Rare. (Infrequent.) Adventive from farther south or west.

3. **PHYSALIS** L. Ground-cherry

Key: Man. p.1255

16. **P. heterophylla** Nees.—Dry, often sandy fields, roadsides, etc. (Eaton, 1921.) Uncommon.

19. **P. ALKEKENGI** L., Chinese Lantern-Plant.—Waste ground, dumps, low open ground. (Eaton, 1957.) Local. Escaped from cultivation in one locality where persisting in some abundance (1969).

7. **DATURA** L. Stramonium, Jimsonweed, Thorn-apple

Key: Man. p.1260

1. **D. STRAMONIUM** L. var. **TATULA** (L.) Torr.—Waste ground, dumps, etc. (Eaton, 1961.) Occasional. Naturalized from Asia. "An ill-scented and dangerously poisonous weed." M. L. Fernald.

9. **PETUNIA** Juss. Petunia

P. VIOLACEA Lindl.—Waste land, open ground near dwellings, etc. (Eaton, 1957.) Casual escape from cultivation. Occasionally persistent.

Family 153. SCROPHULARIACEAE (FIGWORT FAMILY)

Key: Man. p.1261; for artificial key to the twenty-one New England genera, see Fl. N. E. p.477.

1. **VERBASCUM** L. Mullein

1. **V. THAPSUS** L., Common Mullein.—Fields, roadsides, waste ground, etc. (Eaton, 1957.) Common. [Thor.] Naturalized from Europe.

4. **LINARIA** Mill. Toadflax

Key: Man. p.1265

3. **L. VULGARIS** Hill, Butter-and-eggs.—Roadsides, dry fields, waste places. (Hoar, 1857.) Common. [Thor.] Naturalized from Europe.

4. **L. canadensis** (L.) Dumont, Toadflax.—Dry sandy or sterile soil, often weedy. (Eaton, 1930.) Common. [Thor.]

7. **SCROPHULARIA** L. Figwort

1. **S. lanceolata** Pursh.—Thickets, borders of woods, fields,

waste places. (Eaton, 1959.) Uncommon. (Recorded from seven other towns in Middl.)

8. *CHELONE* L. Turtlehead, Snakehead

1. *C. glabra* L.—Wet meadows, stream banks, shores, etc. (H. Mann, Jr., 1867.) Common. [Thor.]

9. *PENSTEMON* Mitchell Beard-Tongue

Key: Man. p.1269. N. B. The student is advised to work with fresh material or else make careful field notes of key characters.

4. *P. DIGITALIS* Nutt.—Moist fields, banks, grassland. (Eaton, 1934.) Occasional. (At Concord locality, still persisting in 1957.) See Rh. 38: 64–67. Adventive from farther west.
11. *P. PALLIDUS* Small.—Sandy or loamy, usually dry fields and banks. (Hoar, 1886.) Occasional. Adventive from farther west.
15. *P. HIRSUTUS* (L.) Willd.—Similar habitats. (Collins, 1878.) Rare. Adventive from farther west.

11. *MIMULUS* L. Monkey-flower

1. *M. ringens* L.—Meadows, shores, wet places. (Eaton, 1957.) Common. [Thor.]

13. *GRATIOLA* L. Hedge-hyssop

Key: Man. p.1275

1. *G. neglecta* Torr.—Wet muds and alluviums, riverbanks, shores. (Eaton, 1958.) Occasional; abundant at two localities. (Known from six other towns in Middl.)
3. *G. aurea* Muhl., Golden-pert.—Similar habitats. (Hoar, 1879.) Common. [Thor.]

18. *LINDERNIA* All. False Pimpernel

Key: Man. p.1279

1. *L. dubia* (L.) Pennell var. *dubia*.—Muddy shores, banks of streams, wet disturbed soils. (Eaton, 1961.) Common.
2. *L. anagallidea* (Michx.) Pennell.—Similar habitats. (Eaton, 1930.) Frequent.

22. *VERONICA* L. Speedwell

Key: Man. p.1280

4. *V. SERPYLLIFOLIA* L., Thyme-leaved Speedwell.—Damp grassy places, moist lawns, disturbed moist soil. (Eaton, 1958.) Probably common. Naturalized from Europe. [Thor.]

6. *V. OFFICINALIS* L., Common Speedwell, Gypsyweed. — Dry fields and open dry woods, often on sterile rocky soil. (Eaton, 1921.) Common. Naturalized from Europe. Indigenous farther north.
9. *V. scutellata* L. — Wet places, meadows, shores. (Hoar, 1958.) Common. [Thor.]
14. *V. peregrina* L. var. *peregrina*, Purslane-Speedwell. — Damp open soil, waste and cultivated land, often weedy. (Hoar, 1858.) Common. [Thor.]
— var. *xalapensis* (HBK.) St. John & Warren. — Similar habitats. (Eaton, 1958.) Uncommon.
15. *V. ARVENTIS* L. Corn Speedwell. — Waste moist or dry open ground, sterile pastures, shaded ledges, etc. (Eaton, 1958.) Common. Naturalized from Europe. [Thor.]
19. *V. PERSICA* Poir., Bird's-eye. — Waste places, roadsides, cultivated land. (Hoar, 1858.) Uncommon. Naturalized from Europe.

24. GERARDIA L. Gerardia

Key: Man. p.1285

6. *G. paupercula* (Gray) Britt. — Meadows, shores, damp open ground. (Hoar, 1857.) Frequent. [Thor.]
11. *G. tenuifolia* Vahl var. *tenuifolia*. — Dry open woods and thickets, dry shaded places. (Hoar, 1879.) Frequent. [Thor.]
22. *G. flava* L., (*G. quercifolia* Pursh). — Deciduous woods. (Thoreau, n.c.d.) Rare. (Uncommon.) Thor. Herb. and here accepted as collected under Fairhaven Cliff along his "Gerardia *quercifolia* path." (Th. J. 5: 436.)
24. *G. pedicularia* L. var. *pedicularia*, False Fox-glove. — Dry deciduous woods and clearings. (Hoar, "Walden Woods.") Occasional. [Thor.] The rare var. *intercedens* (Pennell) Fern. is known from Bedford.

26. CASTILLEJA Mutis Painted-cup

1. *C. coccinea* (L.) Spreng. — Peaty meadows. (Hoar, 1858.) Rare. Formerly abundant in meadow at foot of Annur-snack Hill south side, now apparently extirpated. Latest collection prior to 1901 by Hosmer. Thoreau noted in 1853 that "in color it matches Sophia's cactus blossoms exactly" (Th. J. 5: 128). On 3 June of the same year

(1853) he reported that it was in its prime. "It reddens the meadow —" (Th. J. 5: 220.) [Thor.]

28. MELAMPYRUM L. Cow-wheat

1. **M. lineare** Desr. var. **americanum** (Michx.) Beauverd. — Dry woods. (Eaton, 1957.) Common. For key to the vars., see Man. p. 1294. [Thor.]

33. PEDICULARIS L. Wood-betony, Lousewort

5. **P. canadensis** L., Common Lousewort. — Dry open woods and clearings. (Hoar, 1857.) Uncommon. (Generally distributed and locally abundant.) [Thor.]

Family 154. BIGNONIACEAE (BIGNONIA FAMILY)

1. CAMPsis Lour. Trumpet-flower

1. **C. RADICANS** (L.) Seem., Trumpet-vine or -creeper. — Low woods and thickets. (Eaton, 1957.) Rare. Spontaneous in low woods at Martha's Point. Escaped from cultivation. Introduced from farther south.

3. CATALPA Scop. Catalpa, Indian-bean

Key: Man. p.1301

1. **C. SPECIOSA** Warder, Cigar-tree. — Roadsides, waste places. (Eaton, 1957). Uncommon. Becoming increasingly frequent. Introduced and naturalized from farther south.

Family 156. OROBANCHACEAE (BROOM-RAPE FAMILY)

3. OROBANCHE L. Broom-rape

6. **O. uniflora** L., One-flowered Cancer-root. — Parasitic on various plants, especially *Solidago* in damp thickets and shaded ground. (Carrie Pratt, 9 June, ex Herb. H. Mann, Jr.; Eaton, 1921.) Uncommon. Often transient. [Thor.]

Family 157. LENTIBULARIACEAE

(BLADDERWORT FAMILY)

1. UTRICULARIA L. Bladderwort

Key: Man. p.1304

1. **U. purpurea** Walt. — Slow streams and ponds. (Hoar, 27 July.) Frequent. Thoreau commented on 24 June 1859, "Purple utricularia — Bay" referring to Fairhaven Bay. [Thor.]

2. *U. inflata* Walt. var. *minor* Chapm. — Slow streams and ponds. (Hoar, August, n.d.) Common. [Thor.]
3. *U. geminiscapa* Benj. — Ponds, bog-pools, slow streams. (Eaton, 1933.) Uncommon. Apparently local in Middl.
4. *U. vulgaris* L. — Slow streams and ponds. (Hoar, August.) Common. Often too abundant. [Thor.]
5. *U. gibba* L. — Similar habitats. (Hoar, 1875.) Common. Abundant at Great Meadows impoundments.
8. *U. minor* L. — Shallow pools. (Thoreau, 1857.) Specimen in Thor. Herb. annotated "Owl Nest Swamp Aug. 29, '57." Rare. (Uncommon.)
9. *U. intermedia* Hayne. — Shallow meadows and bog-pools. (Hoar, 1879.) Rare(?) (Uncommon.)
11. *U. cornuta* Michx. — Wet peaty, sandy or muddy shores. (Hoar and Deane, 1887.) Known only from Bateman's Pond. (Occasional.) [Thor.]

Family 159. PHRYMACEAE (LOPSEED FAMILY)

1. *PHRYMA* L. Lopseed

1. *P. Leptostachya* L. — Rich deciduous woods on circum-neutral to basic soils. (Hosmer, n.d.; Eaton, 1957.) Rare: a single station, not seen in recent years. Local.

Family 160. PLANTAGINACEAE (PLANTAIN FAMILY)

1. *PLANTAGO* L. Plantain

Key: Man. p.1313

2. *P. MAJOR* L., Common Plaintain. — Dry or moist, sterile or loamy soil, roadsides, lanes, lawns. (Eaton, 1957.) Apparently a scarce weed. (Frequent, but scattered collections only.) Cosmopolitan weed; naturalized from Europe. [Thor.]
3. *P. Rugelii* Dcne. — Similar habitats. (Eaton, 1957.) Abundant. A native plant that has become a noxious weed.
8. *P. LANCEOLATA* L. var. *LANCEOLATA*. — Grasslands, roadsides, waste places. (Eaton, 1957.) Abundant. A troublesome weed. Naturalized from Europe. [Thor.]
10. *P. ARISTATA* Michx., Bracted Plaintain. — Dry sterile soil, roadsides, etc. (Eaton, 1957.) Frequent. Locally abundant. Naturalized from farther south and west.
12. *P. PURSHII* R. & S. — Dry sandy or gravelly soil, waste ground. (L. E. Richardson, 1962.) Abundant at a

single locality. Known elsewhere in New England from a single station in Vermont. Adventive from farther west.

Family 161. RUBIACEAE (MADDER FAMILY)

Key: Man. p.1318

2. GALIUM L. Bedstraw, Cleavers

Key: Man. p.1319

3. **G. triflorum** Michx. var. **triflorum**, Sweet-scented Bedstraw.
— Woods, moist or dry. (Thoreau, Lee's Cliff, n.d.; Perkins, 1880.) Frequent. Specimen misidentified by Thoreau as *G. Aparine* L.
 4. **G. pilosum** Ait.— Dry open woods. (Hoar, 1857.) Occasional. [Thor.]
 6. **G. circaeans** Michx. var. **circaeans**, Wild Licorice.— Rich woods. (Eaton, 1932.) Rare. Estabrook Woods.
— var. **hypomalacum** Fern. (A. W. Hosmer, n.d.) Occasional. (Frequent.) [Thor.]
 7. **G. lanceolatum** Torr., Wild Licorice.— Dry rich woods. (Eaton, 1932.) Uncommon. [Thor.]
 11. **G. VERUM** L.— Roadsides, dry fields. (Eaton, 1932.) Uncommon. Naturalized from Europe.
 13. **G. MOLLUGO** L.— Roadsides, fields. (Eaton, 1936.) Occasional. (Frequent.) Naturalized from Europe.
 16. **G. palustre** L., Marsh Bedstraw.— Wet meadows, swamps, wet thickets. (Hosmer, n.d.) Frequent.
 17. **G. trifidum** L.— Wet meadows, swamps, shores. (L. E. Richardson, 1966.) (Rare: known from only two towns in eastern Massachusetts north of Plymouth Co.) [Thor.] Another specimen in Thor. Herb. dated "July 18, '56" when Thoreau was in Concord is doubtfully determined. It may not have originated in Concord.
 18. **G. tinctorium** L.— Wet meadows, shores, etc. (C. Jarvis, "1882-1830"; "Causeway near Corner Bridge.") Frequent. The Jarvis specimen is in U. Mass.
 21. **G. obtusum** Bigel.— Meadows, stream banks, shores. (H. Mann, Jr., 1862.) Frequent.
 26. **G. asprellum** Michx., Rough Bedstraw.— Meadows, moist thickets, low ground. (Hosmer, n.d.) Common. [Thor.]
6. MITCHELLA L. Partridge-berry
1. **M. repens** L. forma **repens**, Partridge-berry.— Dry or

moist woods. (H. Mann, Jr., 1862; Frohock, 1880.) Common. [Thor.]

— *forma leucocarpa* Bissell. (L. E. Richardson, 1970.) Rare.

7. **CEPHALANTHUS** L. Buttonbush

1. **C. occidentalis** L. — Riverbanks, pond shores, meadows and swamps. (Eaton, 1922.) Common. [Thor.]

8. **HOUSTONIA** L.

Key: Man. p.1328

1. **H. caerulea** L., Bluets, Quaker-ladies. — Moist fields, pastures, and wet turfly slopes. (Hoar, 1858.) Common. [Thor.]

Family 162. **CAPRIFOLIACEAE** (HONEYSUCKLE FAMILY)

Key: Man. p.1330

1. **DIERVILLA** Duham. Bush Honeysuckle

1. **D. Lonicera** Mill. — Dry open woods, roadsides, railroad banks, etc. (Eaton, 1939.) Frequent. [Thor.]

2. **LONICERA** L. Honeysuckle

Key: Man. p.1331

4. **L. MORROWI** Gray. — Low woods, roadsides, thickets. (Eaton, 1935.) Frequent. Becoming common; locally abundant, being attactive to birds. Introduced from Eurasia.

5. × **L. BELLA** Zabel. — Roadsides and thickets. (Fernald, 1911.) Scarce. (Frequent.) Introduced from Asia.

11. **L. sempervirens** L. — Open woods and thickets. (Hosmer, n.d.; Eaton, 1922: on wall along Estabrook Road). Rare (two stations). (Uncommon.)

3. **SYMPHORICARPOS** Duham. Snowberry

1. **S. ALBUS** (L.) Blake var. **LAEVIGATUS** (Fern.) Blake. — Roadsides, near old dwellings. (L. E. Richardson, 1972.) Rare. Escaped from cultivation and spreading along roadsides. Introduced from Pacific Coast.

4. **LINNAEA** Gronov. Twinflower

1. **L. borealis** L. var. **americana** (Forbes) Rehd. — Cool woods, locally chiefly on north-facing slopes. (H. Mann, Jr., 1862; Eaton, 1930.) Rare. Not seen since 1931, subsequent to an extensive fire in Walden Woods which spread from untended municipal dump. Thoreau found

Linnaea in at least three Concord localities, e.g., "Holden wood-lot". (Th. J. 7: 401.) [Thor.]

5. **TRIOSTEUM** L. Horse-gentian, Feverwort
2. **T. aurantiacum** Bickn. — Rich woods and thickets. (Eaton, 1933.) Very rare. (Occasional.) [Thor.]
6. **VIBURNUM** L. Viburnum, Arrow-wood
Key: Man. p.1338
3. **V. cassinoides** L., Witherod. — Thickets, meadows, borders of woods. (Eaton, 1935.) Common.
5. **V. Lentago** L., Sweet Viburnum, Wild-raisin, Nannyberry. — Moist thickets, stream banks, borders of woods. (Hoar, 1857.) Uncommon. (Frequent.) [Thor.]
11. **V. recognitum** Fern., Arrow-wood. — Similar habitats. (Eaton, 1935.) Common. [Thor.]
12. **V. acerifolium** L., Maple-leaved Viburnum. — Dry or rocky woods. (H. Mann, Jr., 1862.) Common. [Thor.]
14. **V. trilobum** Marsh., Highbush-Cranberry. — Cool woods, thickets, rocky slopes. (Eaton, 1958.) Rare. Known from a single plant in open woods on the bank of Second Division Brook. Minot Pratt is said to have introduced it in Concord, locality unknown, but A. W. Hosmer did not record its survival.
15. **V. OPULUS** L., Guelder-Rose. — Roadsides, moist low thickets. (Eaton, 1964.) Occasional. Introduced from Europe. Frequently planted and sometimes escaping.
7. **SAMBUCUS** L. Elder
2. **S. canadensis** L., Elderberry, Common Elder. — Wet to dry thickets, roadsides, meadows. (Hoar, 1858.) Common. [Thor.]

Family 166. CUCURBITACEAE (GOURD FAMILY)

Key: Man. p.1348

5. **SICYOS** L. Bur-Cucumber
1. **S. angulatus** L. — Riverbanks, rich waste ground, dumps. (Williams, 1896.) Uncommon, but abundant at one locality. (Infrequent.) [Thor.]
6. **ECHINOCYSTIS** T. & G. Wild Balsam-apple
1. **E. lobata** (Michx.) T. & G., Wild or Prickly Cucumber. — Riverbanks and in thickets along brooks. (Eaton, 1957.) Frequent, especially along Concord River.

Family 167. CAMPANULACEAE (BLUEBELL FAMILY)

Key: Man. p.1350

1. SPECULARIA Fabricius Venus's Looking-glass
1. S. **perfoliata** (L.) A. DC. — Woods, ledges, open sterile ground. (Williams, 1908 "in a strawberry bed"; Eaton, 1932.) Rare. (Uncommon but generally distributed in Middl.) [Thor.]
2. CAMPANULA L. Bellflower
Key: Man. p.1351
2. C. TRACHELIUM L., Nettle-leaved Bellflower, Throatwort. (Brewster, 1905: "Waif, springing up by the cabin near Concord River.") Casual. Naturalized from Europe.
3. C. RAPUNCULOIDES L. — Roadsides, near former dwellings. (L. E. Richardson, 1968.) Occasional. Escaped from cultivation and naturalized from Europe.
6. C. **rotundifolia** L., Harebell.— Ledges, rocky banks, low ground, shores. (Fernald, 1909.) Scarce and uncommon, but several stations in Concord. (Frequent.) [Thor.]
7. C. **aparinoides** Pursh, Marsh Bellflower.— Meadows, shores, swampy places. (Williams, 1898.) Frequent. [Thor.]
 4. LOBELIA L. Lobelia
Key: Man. p.1354
1. L. **Cardinalis** L., Cardinal-flower.— Riverbanks, damp shores, brook meadows, etc. (Hoar, 1857.) Frequent, usually scarce, occasionally and transiently abundant. [Thor.]
— forma **rosea** St. John.— Similar habitats. (L. E. Richardson, 1971.) Occasional.
8. L. **spicata** Lam., Pale-spike Lobelia.— Rich meadows, moist fields and low thickets. (Deane, 1886.) Common. [Thor.]
10. L. **inflata** L., Indian-tobacco.— Fields, roadsides, waste ground. (Hoar, 1858.) Common, often weedy. [Thor.]

Family 168. COMPOSITAE (COMPOSITE FAMILY)

Key to Subfamilies and Tribes: Man. p.1358; for an artificial key to all the genera, with five subsidiary keys, see Fl. N. E. p.513.

Subfamily I. TUBULIFLORAE

TRIBE I. VERNONIEAE Cass.

1. VERNONIA Schreb. Ironweed

Key: Man. p.1359

2. *V. noveboracensis* (L.) Michx.—River and brook meadows. (Hoar, 1858, "Low ground near Dr. Riply's [= Monument St. or Flint's] bridge.") Rare. (Uncommon.) At northern limit of range in Middl. Formerly a small colony in river meadow southwest of Nashawtuc Hill; still abundant at Hoar's station. [Thor.] See Th. J. 4: 276.
4. *V. FASCICULATA* Michx.—Rich open soils. (Eaton, 1934.) Adventive from the Midwest. See Rh. 38: 64–67.
6. *V. MISSURICA* Raf.—Rich open soils. (Eaton, 1934.) Adventve from the Midwest. See Rh. 38: 64–67.

TRIBE II. EUPATORIEAE Cass.

Key: Man. p.1361

4. EUPATORIUM L. Thoroughwort

Key: Man. p.1362

1. *E. dubium* Willd., Joe-Pye-weed.—Meadows, damp swales, shores. (Eaton, 1938.) Very common, often dominant in large patches up to a quarter acre or more. [Thor.]
3. *E. fistulosum* Barratt, Joe-Pye-weed—Similar habitats. (Hoar, n.d.) Rare. (Uncommon.) Not seen in recent years. Hoar's station: "Conantum, foot of cliff near spring" [= Martha's Point].
14. *E. pilosum* Walt.—Moist open ground, shores, etc., in acid soil. (H. Mann, Jr., 1862, "fide A. Gray.") Uncommon. Confined mostly to within 30 miles of coast in New England; at northeastern limit of range in Middlesex and Essex counties, Massachusetts.
15. *E. pubescens* Muhl.—Moist to dry woods, thickets, meadows. (C. Jarvis "With C. C. Field," 1835; Williams, 1908.) Rare. (Occasional.) New England distribution somewhat similar to that of No. 14. [Thor.]
19. *E. perfoliatum* L., Boneset.—Meadows, shores, wet open ground. (Hoar, 1857.) Common. [Thor.]
— *forma truncatum* (Gray) Fassett. (Eaton, 1957.) Infrequent.
21. *E. SEROTINUM* Michx.—Fallow fields. (Eaton, 1934.) Rare. Adventive from farther west. See Rh. 38: 64–67.

5. **MIKANIA** Willd. Climbing Hempweed

1. **M. scandens** (L.) Willd.—Riverbanks, low thickets, swamps. (Eaton, 1923.) Frequent. [Thor.]

8. **LIATRIS** Schreb. Blazing-star

9. **L. borealis** Nutt.—Dry sandy fields and banks. (Cummings, 1879.) Rare. (Occasional.) Still present in vicinity of "Caesar's Well" where noted by Thoreau. See Th. J. 4: 348, 9 Sept. 1852. [Thor.]

TRIBE III. ASTEREAE Cass.

Key: Man. p.1376

10. **GRINDELIA** Willd. Tarweed

1. **G. squarrosa** (Pursh) Dunal.—Fallow fields, waste places. (Eaton, 1934.) Uncommon. Adventive from Great Plains. See Rh. 38: 64–67.

14. **SOLIDAGO** L. Goldenrod

For artificial key to the New England taxa, of which 22 species are known to occur in Middl, see Fl. N. E. p.522. For the more comprehensive key to 75 species, see Man. p.1381.

1. **S. caesia** L., Blue-stem Goldenrod.—Sparse, often dry rocky woods, clearings. (Eaton, 1929.) Common. [Thor.]

— × **rugosa** Ait. (Eaton, 1958.) Occasional hybrid. Putative parents in close proximity.

3. **S. flexicaulis** L.—Rich woods. (Hoar, 1858.) Rare. (General but uncommon.) Not seen in recent years.

9. **S. bicolor** L., White Goldenrod, Silver-rod.—Dry, sterile open soil, sparse dry woods. (Hoar, 1857.) Common. [Thor.]

11. **S. puberula** Nutt.—Dry open woods, clearings, sterile peaty soils. (Hoar, 1858.) Common. Sometimes abundant on recent burns. [Thor.]

28. **S. speciosa** Nutt.—Dry to moist thickets, borders of woods. (Thoreau, 1857; Eaton, 1934.) Rare. (Occasional.) A single station, now destroyed, at Clam Shell Bluff, at the precise place where Thoreau found his (misidentified) "S. rigida." See Th. 10: 30.

34. **S. juncea** Ait.—Dry open soil, roadsides, waste places. (Hoar, 1857.) Very common. [Thor.]

37. **S. uliginosa** Nutt. var. **uliginosa**.—Wet peaty ground, acid swamps and meadows. (Thoreau, 1856; Eaton,

- 1932.) Infrequent. (General.) The Thoreau specimen in Thor. Herb. was not identified, but annotated "Radula Swamp, Aug. 10, '56." Thoreau went to Fairhaven Hill and Walden on that day.
- var. *linoides* (T. & G.) Fern. — Sphagnous peats. (Eaton, 1931.) Rare. (Uncommon.) [Thor.]
38. *S. arguta* Ait. — Open woods, clearings, roadside banks, etc. (Eaton, 1957.) Apparently rare. (Infrequent but general.)
48. *S. nemoralis* Ait. — Dry sterile soils, sandy fields, roadsides, etc. (Hoar, 1857.) Common. [Thor.]
51. *S. odora* Ait., Sweet Goldenrod. — Dry soils, thin woods, roadsides. (Eaton, 1954.) Uncommon. (Frequent.) Occurs in two areas below Flint's Bridge: vicinity of filter beds and across the river near Ball's Hill. [Thor.] Crushed foliage has odor of anise seed.
55. *S. ulmifolia* Muhl. — Dry, often rocky woods, rarely in meadows. (Thoreau, n.d.) Rare. (Uncommon.) North-eastern limit of range in Essex Co., Massachusetts. Thoreau's specimen in Thor. Herb. mounted on a sheet of *Penthorum sedoides* with annotation "Concord — what?"
56. *S. rugosa* Ait. var. *rugosa*. — Fields, thickets, clearings, open woods, etc. (Hoar, 1858.) Abundant.
- var. *aspera* (Ait.) Fern. (*S. aspera* Ait.). — Dry or damp open soil or thin woods and thickets. (Eaton, 1957.) Frequent.
58. *S. candensis* L. — Fields, roadsides, borders of river meadows, etc. (Hoar, 1858.) Abundant. [Thor.]
59. *S. altissima* L. — Dry to moist deep open soils, roadsides, thickets, etc. (Eaton, 1930.) Uncommon. (Infrequent but general.) [Thor.]
64. *S. gigantea* Ait. var. *gigantea*. — Moist to dry open soil. (Thoreau, 1856; Hoar, 1857.) Common. Thoreau specimen in Thor. Herb. annotated "By R.R., Aug. 23, 1856."
- var. *leiophylla* Fern. (var. *serotina* (Ait.) Cronq.). — Similar habitats, usually in better soils. (Eaton, 1932.) Common.
72. *S. graminifolia* (L.) Salisb. var. *Nuttallii* (Greene) Fern. — Dry fields and roadsides, moist open ground, shores, swampy ground. (Hoar, 18 Sept.) Common. [Thor.]

19. ASTER L. Aster, Frost-flower

For artificial key to the New England taxa of which 23 species are known to occur in Middl., see Fl. N. E. p.529. For the more comprehensive key to 68 species, see Man. p.1416.

2. **A. divaricatus** L.—Dry or moist woods and clearings. (Thoreau, 1856; Hoar, 1857.) Common. Thoreau specimen in Thor. Herb. and annotated "Corner Spiny Path" and "Above Hemlocks, Aug. 9, '56."
6. **A. macrophyllus** L. var. **macrophyllus**.—Dry to moist open woods, thickets and clearings. (Eaton, 1957.) Uncommon. (General.) Forms large clones up to 3 m and more in diameter. [Thor.]
—var. **sejunctus** Burgess.—Similar habitats. (Eaton, 1957.) Uncommon. (General. Common westward.)
—var. **ianthinus** (Burgess) Fern.—Similar habitats. (Eaton, 1932.) Apparently rare. (Uncommon.)
10. **A. cordifolius** L. var. **cordifolius**.—Thickets, roadsides, usually in moist, partially shaded ground. (Eaton, 1957.) Frequent. (Common.) Unaccountably scarce in Concord; often abundant and weedy in Middl. [Thor.]
14. **A. undulatus** L. var. **undulatus**.—Dry open, often rocky woods, fields, roadsides. (Hoar, 1857.) Common. [Thor.]
15. **A. patens** Ait.—Dry open woods, fields. (Hoar, 1857.) Frequent. [Thor.]
18. **A. novae-angliae** L. forma **novae-angliae**, New England Aster.—Damp fields, shores. (Eaton, 1957.) Common. Rapidly increasing in abundance. The status of this species as an indigenous plant in Concord is questionable. Formerly much cultivated, but apparently unrecorded as occurring in a natural state prior to the mid-20th century. Specimens from eastern Massachusetts in NEBC are scanty and suggestive of its infrequent if not rare occurrence in former times. It may well be a rapidly increasing escape from cultivation.
—forma **roseus** (Desf.) Britt. (Eaton, 1934.) Occasional.
23. **A. puniceus** L. var. **puniceus**.—Meadows, open wooded swamps, etc. (Eaton, 1931.) Common, often abundant. [Thor.]
—forma **candidus** Fern. (Eaton, 1961.) Occasional.

- var. *firmus* (Nees) T. & G. (Eaton, 1961.) Uncommon.
28. *A. laevis* L. forma *laevis*. — Dry open ground. (Hoar, 1857.) Uncommon. (Frequent.) [Thor.]
— forma *latifolius* (Porter) Shinners. (Eaton, 1931.) Uncommon.
33. *A. radula* Ait. — Bogs, sphagnous swamps and shores. (Hoar, 1858; Williams, 1908.) Rare. (Uncommon.) [Thor.]
34. *A. pilosus* Willd. var. *pilosus*. — Dry fields, roadsides, waste places. (Eaton, 1938; 1961; 1968.) Uncommon. (Rare?) This var. is occasional in New England and known in Middl. from Concord and Bedford. The common var. *demotus* Blake has not yet (1974) been collected in Concord.
37. × *A. amethystinus* Nutt. — Dry or moist open ground. (Eaton, 1958.) Rare. Generally considered a recurrent hybrid between Nos. 38 and 18.
38. *A. ericoides* L. — Dry fields, waste places. (Eaton, 1931.) Common. [Thor.]
40. *A. dumosus* L. var. *dumosus*. — Dry to wet sandy and clayey open ground, thickets and shores. (Hoar, 1857.) Common. [Thor.]
41. *A. vimineus* Lam. var. *vimineus*. — Fields, often in moist to wet depressions, shores, meadows, etc. (Eaton, 1956.) Very common. [Thor.]
— var. *subdumosus* Wieg. (Eaton, 1958.) Rare.
42. *A. lateriflorus* (L.) Britt. var. *lateriflorus*. — Dry to moist fields, thickets, meadows, shores, etc. (Eaton, 1931.) Common.
— var. *pendulus* (Ait.) Burgess. (Hoar, 1857.) Rare. (General, but uncommon.)
46. *A. simplex* Willd. var. *simplex*. — Meadows, shores, damp thickets. (E. Faxon, 1890.) Common.
— var. *ramosissimus* (T. & G.) Cronq. (Eaton, 1931.) Common. In Middl., the commoner variety. [Thor.]
56. *A. novi-belgii* L. var. *novi-belgii*. — Meadows, shores, damp thickets, etc. (Hoar, 1857.) Very common. [Thor.]
61. *A. acuminatus* Michx. — Dry or moist woods and recent clearings. (Eaton, 1921.) Common, often abundant. [Thor.]

63. *A. umbellatus* Mill.—Meadows, damp thickets, swamps.
(Hoar, 1857.) Very common. [Thor.]
64. *A. infirmus* Michx.—Dry, deciduous, usually rocky woods.
(C. C. Field, 1835 (1839?); Collins, 1886.) Rare. At northeastern limit of range in Middl. The Field specimen is at U. Mass. [Thor.]
65. *A. linariifolius* L. forma *linariifolius*. Dry sandy open soil,
ledges and rocky banks. (Eaton, 1928.) Common.
[Thor.]
— *forma leucactis* Benke. (Hosmer, n.d.) Occasional.

20. ERIGERON L. Fleabane

Key: Man. p.1442

5. *E. pulchellus* Michx., Robin's-plantain.—Fields, copses.
(H. Mann, Jr., 1862.) Common. [Thor.]
8. *E. annuus* (L.) Pers., Daisy Fleabane.—Fields, roadsides,
waste places. (Eaton, 1957.) Common, often weedy.
[Thor.]
9. *E. strigosus* Muhl. var. *strigosus*, White-top, Daisy Fleabane.—Fields, dry open soil. (Hoar, 1857.) Very common, often weedy. [Thor.]
— var. *septentrionalis* (Fern. & Wieg.) Fern. (H. Mann, Jr., 1862.) Uncommon.
15. *E. canadensis* L., Horse-weed, Hog-weed.—Waste ground,
cultivated fields, etc. (Hoar, 1858.) Very common.
Weedy. [Thor.]

21. SERICOCARPUS Nees White-topped Aster

1. *S. asteroides* (L.) BSP.—Dry, open woods. Clearings,
roadsides. (Hoar, 1858.) Frequent. [Thor.]
2. *S. linifolius* (L.) BSP.—Dry woods, clearings. (Jenks,
1890.) Infrequent, scarce. (General, but scarce.)
[Thor.] The specimen in Thor. Herb. lacks collection
data and was misidentified as No. 1 above.

TRIBE IV. INULEAE Cass.

Key: Man. p.1448

25. ANTENNARIA Gaertn.

Dog's-toes, Pussy's-toes, Ladies'-tobacco

Key: Man. p.1450

18. *A. neglecta* Greene.—Sterile fields, pastures, roadsides.
(Hoar, 1858.) Frequent.

22. A. *neodioica* Greene var. *neodioica*. — Dry fields, pastures, lawns, etc. (Eaton, 1956.) Very common. Our commonest species.
 — var. *chlorophylla* Fern. — Dry open woods and fields. (Eaton, 1930.) Rare. Apparently the only Massachusetts record east of Worcester Co.
28. A. *fallax* Greene. — Dry open woods, fields, roadsides. (Eaton, 1956.) Uncommon. (General, but infrequent.)
29. A. *Parlinii* Fern. — Similar habitats. (Eaton, 1956.) Apparently rare. (Uncommon, but rather general.)
31. A. *plantaginifolia* (L.) Hook. — Fields, pastures, dry open woods, etc. (Eaton, 1956.) Common. [Thor.]

26. ANAPHALIS DC. Everlasting

1. A. *MARGARITACEA* (L.) C. B. Clarke var. *MARGARITACEA*. — Dry fallow fields, where adventive from the west. (Eaton, 1934.) Rare. See Rh. 38: 64.
 — var. *intercedens* Hara. — Dry fields, clearings, open woods. (Hoar, 1857.) Frequent. Indigenous. This is the showy "Everlasting" sought for dried winter bouquets. [Thor.]

27. GNAPHALIUM L. Cudweed, Everlasting

Key: Man. p.1463

2. G. *obtusifolium* L. var. *obtusifolium*. — Dry fields and clearings. Waste places. (Fernald, 1916.) Common. [Thor.]
4. G. *uliginosum* L. — Ditches, damp roadsides, waste places, open woods and clearings. (Hoar, 1857.) Common, often weedy. [Thor.]

28. INULA L.

1. I. *HELENIUM* L. — Roadsides, damp pastures, fencerows and clearings. (Hoar, 1857.) Rare. (Occasional.) Naturalized from Europe. [Thor.]

TRIBE V. HELIANTHEAE Cass.

Key: Man. p.1465

32. AMBROSIA L. Ragweed

3. A. *artemisiifolia* L. var. *artemisiifolia*. — Roadsides, cultivated land. (L. E. Richardson, 1966.) Apparently rare. Seldom collected. Perhaps overlooked.
 — var. *elatior* (L.) Descourtils, Common Ragweed,

Roman Wormwood.—Waste places, roadsides, cultivated land. (Williams, 1908.) Abundant. A pernicious weed, its pollen being a common allergen. [Thor.]

— *forma villosa* Fern. & Grisc. (Eaton, 1957.) Probably frequent, seldom collected.

44. RUDBECKIA L. Coneflower

Key: Man. p.1480

1. *R. laciniata* L.—Rich low open ground and swampy thickets. (Eaton, 1957.) Apparently rare; known from a single station where scarce. (Infrequent, but general.) [Thor.]
18. *R. SEROTINA* Nutt., Yellow Daisy, Black-eyed Susan.—Fields, roadsides, waste places. (Hoar, 1858.) Abundant, weedy. Indigenous in the Great Plains, and spreading eastward rapidly after settlement of the intervening land. [Thor.]

49. HELIANTHUS L. Sunflower

Key: Man. p.1487

1. *H. ANNUUS* L., Common Sunflower.—Waste places, fallow fields, roadsides. (Eaton, 1957.) Infrequent. Adventive from farther west or spreading from cultivation. [Thor.]
8. *H. LAETIFLORUS* Pers. var. *LAETIFLORUS*.—Waste places, fields. (Eaton, 1957.) Occasional. Adventive from farther west or spreading from cultivation.
— var. *RIGIDUS* (Cass.) Fern., Prairie Sunflower.—Similar habitats. (Eaton, 1934; 1957.) Rare. Adventive from farther west.
11. *H. divaricatus* L.—Roadsides, dry thickets and open woods. (Hoar, 1858.) Uncommon. (Frequent.) [Thor.]
18. *H. strumosus* L.—Similar habitats. (Collins, 1886.) Uncommon. (Frequent.) A specimen in Thor. Herb. is annotated "Tall Helianthus, Aug. 11, '56. Corner Rd." but doubtfully determined.
20. *H. decapetalus* L.—Open woods and thickets. (Thoreau, 1856.) Rare. (Uncommon.) Specimen annotated "Aug. 29, '56, Assabet R." Doubtfully determined.
21. *H. TUBEROSUS* L., Jerusalem Artichoke.—Rich open soil, fields, waste land. (Eaton, 1958.) Uncommon. (Frequent.) Adventive from farther west or escaped from

cultivation and generally naturalized. Often a persistent weed in cultivated land. [Thor.]

[54. COREOPSIS L. Coreopsis

No members of this genus have been reported from Concord, but the native *C. rosea* has been found in Sudbury, Framingham, Natick, and (commonly) at Winter Pond in Winchester. A specimen in Thor. Herb. lacks collection data. Five other species, all either adventive or escapes from cultivation and originating from farther west or north, are occasionally found in New England and may turn up in Concord. The key to these six species may be found in Fl. N. E. p.551.]

55. BIDENS L. Bur-Marigold, Beggar's-ticks

Key: Man. p.1499

1. **B. laevis** (L.) BSP.— Marshy riverbanks, margins of pools and brooks. (Hoar, 1858.) Uncommon. [Thor.]
2. **B. cernua** L. var. **cernua**.— Meadows, stream banks, pond shores. (Williams, 1896.) Common.
—— var. **elliptica** Wieg. (Williams, 1899.) Frequent.
4. **B. connata** Muhl. var. **connata**.— Meadows, shores, swamps. (Hoar, 1857.) Common. [Thor.]
10. **B. comosa** (Gray) Wieg.— Wet shores and swamps. (Eaton, 1928.) Rare(?) : known in Concord from the shore of Goose Pond. (Occasional.) This species is infrequent in New England.
12. **B. vulgata** Greene, Beggar's-ticks, Stick-tight.— Moist low ground, ditches, roadsides, waste ground. (Eaton, 1957.) Common. Weedy.
13. **B. frondosa** L.— Meadows, shores, moist places. (Hoar, 1857.) Common. [Thor.]
14. **B. discoidea** (T. & G.) Britt.— Marshy pond shores and wet peats or sands. (Eaton, 1957.) Local. (Uncommon). Abundant along swampy borders of pond-holes beside Estabrook Road.
17. **B. ARISTOSA** (Michx.) Britt. var. **MUTICA** Gray.— Fallow fields, waste places. (Eaton, 1934.) A rare adventive from the west at Clam Shell Bluff, to be added to the list reported in Rh. 38: 64.

57. MEGALODONTA Greene Water-Marigold

1. **M. Beckii** (Torr.) Greene.— Ponds and slow streams.

(Hoar, 1857.) Formerly common, now rather scarce. (Frequent.) This showy yellow-flowered riverweed may have been depleted by pollution. [Thor.]

59. **GALINSOGA R. & P.**

Key: Man. p.1510

1. **G. CILIATA** (Raf.) Blake.—Waste places, cultivated ground. (Eaton and L. E. Richardson, 1958.) Frequent, becoming too common and weedy. (Common.) Naturalized from tropical America.

TRIBE VI. **HELENIEAE** Cass.

Key: Man. p.1511

65. **HELENIUM L.** Sneezeweed

Key: Man. p.1512

2. **H. NUDIFLORUM** Nutt. (now generally accepted as *H. flexuosum* Raf.).—Fields, meadows, damp waste places. (Eaton, 1920.) Occasional. (Uncommon.) Adventive from farther south and rapidly spreading northward into New England where locally sometimes abundant.
3. **H. AUTUMNALE** L. var. **AUTUMNALE** (fide H. L. Rock, 1956.) — Fields, meadows. (Eaton, 1934.) Rare. Adventive from farther west. See Rh. 38: 64. An unidentified variety of this species occurred abundantly in Wheeler's Meadow near Nashawtuc Bridge about 50 years ago.

TRIBE VII. **ANTHEMIDEAE** Cass.

Key: Man. p.1514

69. **ACHILLEA L.** Yarrow

4. **A. MILLEFOLIUM** L., Common Yarrow.—Fields, roadsides, thin lawns, dry waste places. (Hoar, 1858.) Common. Ligules often pinkish, sometimes shading to deep rose-purple in forma *rosea* Rand & Redfield. Naturalized from Europe.

70. **ANTHEMIS L.** Chamomile

Key: Man. p.1515

1. **A. COTULA L.**, Dog-Fennel, Stinking Chamomile.—Waste ground, roadsides, etc. (Hoar, 1858.) Common. Naturalized from Europe. [Thor.]

71. *MATRICARIA* L. Wild Chamomile

Key: Man. p.1516

3. *M. MATRICARIOIDES* (Less.) Porter, Pineapple-weed.— Similar habitats. (Eaton, 1957, when infrequent.) Frequent. (Common.) Odor of bruised plant suggestive of pineapple. Naturalized from Pacific States.

72. *CHRYSANTHEMUM* L. Chrysanthemum

1. *C. LEUCANTHEMUM* L. var. *PINNATIFIDUM* Lecoq & Lamotte, White Daisy, Ox-eye-Daisy.— Fields, roadsides, waste land, etc. (Eaton, 1958.) Abundant. A beautiful but pernicious weed. Naturalized from Europe. [Thor.]

73. *TANACETUM* L. Tansy

1. *T. VULGARE* L. forma *VULGARE*, Common Tansy.— Waste places, roadsides. (Eaton, 1958.) Common. Often aggregated in large, showy patches. Naturalized from Europe.
— forma *CRISPUM* (L.) Hayek.— (Jenks, 1889.) Uncommon.

75. *ARTEMISIA* L. Wormwood

Key: Man. p.1519

10. *A. VULGARIS* L., Common Mugwort.— Waste land, thickets, roadsides, railroads. (Rodman, 1891.) Uncommon. (Frequent.) Naturalized from Europe. [Thor.]
14. *A. LUDOVICIANA* Nutt., Western Mugwort, White Sage.— An excessively variable species. For a key to the vars. see Man. p. 1523; for a key to vars. known from New England, see Fl. N. E. p. 562. The Concord citations refer to collections made at Clam Shell Bluff; not yet recorded elsewhere from the township. See Rh. 38: 64–69. All varieties adventive from the west. (Scarce.)
— var. *LUDOVICIANA* Nutt. (Eaton, 1934.) Rare. Two other records from New England.
— var. *GNAPHALODES* (Nutt.) T. & G. (Eaton, 1934.) Rare.
— var. *LATIFOLIA* (Bess.) T. & G. (Eaton, 1934.) Rare. Not reported, otherwise, from Massachusetts east of Berkshire Co.
— var. *AMERICANA* (Bess.) Fern. (Eaton, 1934.) Rare: no other record from New England. Plentiful at Clam Shell Bluff.

- A. TRIDENTATA Nutt., Sagebrush. (Eaton, 1934.) Plentiful at Clam Shell Bluff until destroyed by extensive building operations many years later. Apparently the first and only report of its spontaneous occurrence in Man. range. Adventive from Plain States. Species not keyed in Man. or Fl. N. E. See Rh. 38: 64-69 for this and the following Nos. 16 and 17.
16. A. ABSINTHIUM L., Wormwood, Absinthe. (Eaton, 1934.) — Rare. (Uncommon.) Originally introduced from Europe, spreading from cultivation and naturalized very sparingly throughout much of New England.
17. A. FRIGIDA Will., Prairie Sage-wort. (Eaton, 1934.) Rare. First record from Massachusetts east of Worcester Co.

TRIBE VIII. SENECLIONEAE Cass.

Key: Man. p.1524

[76. TUSSILAGO L. Colt's-foot

The common representative of the genus, *T. Farfara* L., surprisingly has not yet been reported from Concord where it undoubtedly occurs along some railroad or moist bank. Introduced from Europe.]

79. ERECHTITES Raf.

1. E. hieracifolia (L.) Raf. var. *hieracifolia*, Fireweed.— Damp woods, clearings, wet fields, burns. (Hoar, 1857.) Common. [Thor.] Note: see Fl. N. E. p. 563 for comment on the taxonomic validity of this and the two other varieties recognized in Man. p. 1528.
— var. *praealta* (Raf.) Fern. (Eaton, 1959.) Common.

81. SENEPIO L. Ragwort, Groundsel

Key: Man. p.1529

19. S. aureus L. var. *intercursus* Fern., Golden Ragwort.— Wooded swamps and brook margins, meadows, etc. (Hoar, 1858.) Frequent. [Thor.]

82. ARCTIUM L. Burdock

Key: Man. p.1537

3. A. NEMOROSUM Lej. & Court. — Waste ground, borders of cart roads, etc. (Eaton, 1957.) Occasional. Naturalized from Europe.
4. A. MINUS (Hill) Bernh., Common Burdock. — Waste land, roadsides. (Eaton, 1958.) Common, often a weed in

undisturbed shrubberies, barnyards, etc. Naturalized from Europe.

85. *CIRSIUM* Mill. Common or Plumed Thistle

Key: Man. p.1539

1. C. *VULGARE* (Savi) Tenore, Common or Bull-Thistle.— Pastures, fields, clearings, roadsides. (Eaton, 1959.) Common. An aggressive weed. Naturalized from Europe. [Thor.]
15. C. *pumilum* (Nutt.) Spreng., Pasture or Bull-Thistle.— Dry open soil. (Hoar, 1888.) Rare. (Infrequent.) [Thor.]
17. C. *ARVENSE* (L.) Scop., Canada Thistle.— Fields, pastures, waste ground. (L. E. Richardson, 1964.) Very scarce! (Common, often abundant.) “Ubiquitous weed”: M. L. Fernald. Naturalized from Europe.

87. *CENTAUREA* L. Star-Thistle

Key: Man. p.1543

4. C. *CYANUS* L., Bachelor's Button, Cornflower.— Waste land, dumps, roadsides, etc. (Deane, 1893.) Occasional. Escaped from cultivation. Introduced from Europe.
7. C. *NIGRA* L. var. *NIGRA* (?), Knapweed, Spanish-buttons.— Fields, meadows, clearings. (Eaton, 1920.) Occasional. Naturalized from Europe. A variable species. Includes var. *radiata* DC. (= forma *radiata* DC.) F. C. Seymour. [Thor.]
11. C. *MACULOSA* Lam.— Fields, roadsides, waste places. (Eaton, 1934.) Uncommon. Spreading rapidly elsewhere in New England and locally abundant. Naturalized from Europe.

Subfamily II. *LIGULIFLORAE*

Key: Man. p.1358

TRIBE X. *CICHORIEAE* Spreng.

Key: Man. p.1546

92. *CICHORIUM* L. Chicory, Succory

1. C. *INTYBUS* L., Common Chicory.— Waste places, fields, roadsides, railroads. (Eaton, 1957.) Frequent, rare prior to 1900. (Common.) [Thor.] Naturalized from Europe.

93. KRIGIA Schreb. Dwarf Dandelion

2. *K. virginica* (L.) Willd.—Dry sterile soil in open woods, clearings, fields. (Eaton, 1929.) Common. [Thor.]

95. LEONTODON L. Hawkbit

1. *L. AUTUMNALIS* L. var. *AUTUMNALIS*, Fall Dandelion.—Fields, roadsides, lawns. (Hoar, 1857.) Common. An ubiquitous weed. Naturalized from Europe. [Thor.]

97. TRAGOPOGON L. Goat's-beard

2. *T. PRATENSIS* L., Goat's-beard.—Fields, roadsides, etc. (L. E. Richardson, 1959.) Frequent. Locally abundant and becoming a troublesome weed. Naturalized from Europe.

99. TARAXACUM Zinn Dandelion

Key: Man. p.1550

9. *T. ERYTHROSPERMUM* Andr., Red-seeded Dandelion.—Dry thin soil, pastures, lawns. (Eaton, 1922.) Common. Naturalized from Europe.

10. *T. OFFICINALE* Weber, Common Dandelion.—Lawns, grasslands, waste places. (Hoar, 1858.) Abundantly ubiquitous. Naturalized from Europe. [Thor.]

100. SONCHUS L. Sow-Thistle

Key: Man. p.1553

1. *S. ARVENSIS* L., Field Sow-thistle.—Roadsides, fields, waste places. (Eaton, 1957.) Infrequent. (Frequent.) Often a noxious weed. Naturalized from Europe.

4. *S. ASPER* L., Spiny-leaved Sow-Thistle.—Waste places, roadsides, etc. (Hoar, 1888.) Common. Naturalized from Europe.

101. LACTUCA L. Lettuce

Key: Man. p.1554

2. *L. SCARIOLA* L. forma *SCARIOLA*, Prickly Lettuce.—Roadsides, waste ground. (Eaton, 1957.) Infrequent. Naturalized from Europe.

— forma *INTEGRIFOLIA* (Bogenh.) G. Beck. (Eaton, 1957.) Frequent. Naturalized from Europe.

4. *L. canadensis* L. var. *canadensis* forma *canadensis*, Wild Lettuce.—Thickets, borders of woods, clearings, roadsides. (Eaton, 1958.) Frequent.

— forma *angustata* Wieg.—Similar habitats. (Hoar, 1858.) Occasional.

— var. *longifolia* (Michx.) Farw. — Similar habitats.
(Eaton, 1958.) Common.

— var. *latifolia* Ktze. — Similar habitats. (Eaton,
1957.) Common. [Thor.]

11. *L. biennis* (Moench) Fern., Blue Lettuce. — Damp thickets,
clearings, low open ground. (Hoar, 1858.) Common.
[Thor.]

106. *PRENANTHES* L. Rattlesnake-root

Key: Man. p.1560

6. *P. alba* L., Rattlesnake-root. — Rich woods and thickets,
mostly moist. (Eaton, 1957.) Frequent. [Thor.]
7. *P. Serpentaria* Pursh, Lion's-foot. — Dry open woods,
thickets, clearings. (Hoar, 1857.) Uncommon. Middl.
near northern limit of range.
8. *P. trifoliolata* (Cass.) Fern., Gall-of-the-earth. — Dry or
moist open woods, clearings, thickets. (Hoar, 1857.)
Common.
9. *P. altissima* L. forma *altissima*. — Woods, usually moist.
(Thoreau, 1857.) Uncommon. Specimen in Thor. Herb.
annotated "Botrychium Swamp, '57" which is in the
Estabrook Woods.
- forma *hispidula* Fern. — Moist woods. (Hoar,
1858.) Uncommon. The species is variable both as to
indument and foliage. Three formae are recognized
in Middl. and are equally uncommon.

107. *HIERACIUM* L. Hawkweed

Key: Man. p.1562. For an artificial key to the New England species,
see Fl. N. E. p.576.

1. *H. PILOSELLA* L., Mouse-ear. — Dry, open soil, often in
lawns. (Eaton #5206, 1962.) Scarce. Rapidly spreading,
often forming large patches elsewhere in southern
New England. Often confused with No. 2. Naturalized
from Europe.
2. *H. FLAGELLARE* Willd. — Similar habitats. (Eaton, 1958.)
Common. Has become an obnoxious, rapidly spreading
weed in recent years. Naturalized from Europe.
3. *H. AURANTIACUM* L., Orange Hawkweed, Devil's Paint-
brush. — Fields, clearings, grassland. (L. E. Richardson,
1958.) Common. A relatively recent arrival in
Middl., apparently spreading eastward from western
New England where long established as a troublesome

- weed of hay fields, lawns, and gardens. Naturalized from Europe.
- 5. **H. PRATENSE** Tausch, King Devil.—Fields, roadsides, grasslands. (Eaton, 1958.) Common. Rapidly increasing in recent years. Naturalized from Europe.
 - 7. **H. FLORENTINUM** All., King Devil.—Fields, roadsides, waste places, etc. (Eaton, 1958.) Common. A very aggressive weed of grasslands. Naturalized from Europe.
 - 9. **H. VULGATUM** Fries.—Thickets, open groves, roadsides, etc. (Eaton, 1958.) Infrequent. An aggressive weed elsewhere, but not yet common in Middl. Naturalized from Europe.
 - 12. **H. canadense** Michx. var. **fasciculatum** (Pursh) Fern.—Dry open woods, clearings, roadsides. (Hoar, 1858.) Frequent. (General.) [Thor.]
 - 15. **H. venosum** L. var. **nudicaule** (Michx.) Farw.—Dry open woods, clearings. (H. Mann, Jr., 1862.) Common. [Thor.]
 - 16. **H. paniculatum** L.—Dry open woods. (Eaton, 1957.) Frequent. [Thor.]
 - 17. **H. scabrum** Michx.—Dry open woods, clearings. (Hoar, 1857.) Common. [Thor.]
H. Marianum Willd.—Dry sandy soil, open woods, railroads, etc. (Eaton, 1938.) Uncommon. Previously collected in Middl. by F. S. Collins in 1895. According to Fernald, combining traits of Nos. 15, 16, and 17 in a heteromorphic series and presumably of hybrid origin and somewhat apomictic.

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APPENDIX

List of plants occurring in Middlesex which are not represented by known specimens or reliable reports from Concord, but which may occur there, the presumed likelihood of occurrence being indicated by one of three symbols:

P. — Probable.

U. — Rather unlikely, but to be looked for.

V.U. — Very unlikely. Rarities mostly limited by ecological factors or specialized habitats known to exist sparingly in Concord.

Species within the genera are arranged alphabetically. Excluded from the list are plants that are represented by a single specimen from a single location and deemed to be casual or too rare to be accepted as a permanent element of our local flora.

ISOÉTACEAE

V.U. *Isoëtes Engelmanni* A. Br.

U. *I. Tuckermani* A. Br.

OPHIOGLOSSACEAE

V.U. *Botrychium lanceolatum* (Gmel.) Angstr. var. **angustisegmentum** Pease & Moore

V.U. *B. multifidum* (Gmel.) Rupr. var. **multifidum**

U. ————— var. **intermedium** (D. C. Eat.) Farw.

POLYPODIACEAE

V.U. *Cystopteris fragilis* (L.) Bernh. var. **fragilis**

U. *Dryopteris cristata* (L.) Gray var. **Clintoniana** (D. C. Eat.) Underw.

U. *Athyrium Filix-femina* (L.) Roth var. **asplenioides** (Michx.) Farw.

V.U. *Woodwardia areolata* (L.) Moore

SPARGANIACEAE

V.U. *Sparganium fluctuans* (Morong) Robins.

V.U. *S. minimum* (Hartm.) Fries

ZOSTERACEAE

U. *Potamogeton Berchtoldi* Fieber var. **Berchtoldi**

V.U. ————— var. **lacunatus** (Hagstr.) Fern.

P. ————— var. **tenuissimus** (Mert. & Koch) Fern.

- U. **P. foliosus** Raf. var. **macellus** Fern.
- V.U. **P. Friesii** Rupr.
- P. **P. illinoencis** Morong
- U. **P. obtusifolius** Mert. & Koch. Billerica, C. B. Hellquist, 10 June 1971. A rare species in eastern Massachusetts.
- U. **P. perfoliatus** L. var. **bupleuroides** (Fern.) Farw.
- V.U. **P. praelongus** Wulfen
- U. **P. pusillus** L. (The only specimen from Massachusetts east of Berkshire Co. in NEBC was collected in Sudbury River, Wayland. Although a rare species in New England, perhaps it should be considered Probable in Concord.)
- V.U. **P. Vaseyi** Robbins

ALISMATACEAE

- U. **Alisma triviale** Pursh
- U. **Sagittaria Engelmanniana** J. G. Sm.
- U. **S. rigida** Pursh
- V.U. **S. teres** S. Wats. Sandy Pond, Lincoln, Massachusetts, 1894

HYDROCHARITACEAE

- U. **Elodea canadensis** Michx.

GRAMINEAE

- P. **BROMUS COMMUTATUS** Schrad.
- U. **B. Dudleyi** Fern.
- U. **B. latiglumis** (Shear) Hitchc., (*B. purgans* L.). See nomenclatural changes in *Bromus*. Wagner, H. K. Rh. 52: 211-15.
- U. **B. MOLLIS** L.
- P. **B. purgans** L., (*B. pubescens* Muhl. ex Willd.). See note under *B. latiglumis*.
- U. **B. THOMINII** Hardowin, incl. var. (forma) **HIRSUTUS** Holmb.
- P. **Festuca obtusa** Biehler
- U. **F. OVINA** L. var. **DURIUSCULA** (L.) W. D. J. Koch
- V.U. **F. rubra** L. var. **multiflora** (Hoffm.) Aschers. & Graebn.
- U. **Glyceria laxa** Scrib.
- V.U. **G. melicaria** (Michx.) F. T. Hubbard
- P. **Poa nemoralis** L.
- P. **BRIZA MEDIA** L.
- P. **DACTYLIS GLOMERATA** L. var. **CILIATA** Peterm.

- U. **Eragrostis capillaris** (L.) Nees. (Occurrence perhaps Probable.)
- P. E. **MEGASTACHYA** (Koel.) Link, (*E. cilianensis* (All.) E. Mosher). For name, see Rh. 68: 441 (1966).
- U. **E. multicaulis** Steud.
- U. **E. POAEOIDES** Beauv.
- U. **AGROPYRON REPENS** (L.) Beauv. var. **SUBULATUM** (Schreb.) Reichenb., including the more (locally) common forma **VAILLANTIANUM** (Wulf. & Schreb.) Fern.
- V.U. **A. trachycaulum** (Link) Malte var. **novae-angliae** (Scribn.) Fern.
- U. **LOLIUM MULTIFLORUM** Lam.
- P. L. **PERENNE** L.
- U. **Hordeum jubatum** L.
- U. **Elymus canadensis** L.
- V.U. **E. villosus** Muhl.
- U. **Hystrix patula** Moench var. **patula**
- P. **Sphenopholis intermedia** Rydb. Thoreau: Lincoln, 10 July 1860; "J. Baker's mud hole."
- U. **S. nitida** (Biehler) Scribn.
- V.U. **S. obtusata** (Michx.) Scribn. var. **lobata** (Trin.) Scribn. Thoreau: Lincoln, 4 July 1859; "Pleasant Meadow." This specimen erroneously attributed to Concord on the NEBC accession label.
- V.U. **Deschampsia caespitosa** (L.) Beauv. var. **glaucia** (Hartm.) Lindm. f.
- U. **Danthonia compressa** Aust.
- U. **D. spicata** Beauv. var. **longipila** Scrib. & Merr.
- V.U. **Sporobolus asper** (Michx.) Kunth
- U. **Muhlenbergia glomerata** (Willd.) Trin. var. **glomerata**. Thoreau: "Lincoln, Mass. Sept. 17, 1858; Beaver Pond."
- U. **M. tenuiflora** (Willd.) BSP.
- P. **Oryzopsis asperifolia** Michx.
- U. **O. racemosa** (Sm.) Ricker
- U. **Stipa avenacea** L.
- U. **Aristida longespica** Poir. var. **geniculata** (Raf.) Fern.
- P. **Spartina pectinata** Link var. **Suttiei** (Farw.) Fern. Although uncommon in Middl., it has been found in the Concord River meadows at Bedford.
- P. **Leersia virginica** Willd.
- U. —— var. **ovata** (Poir.) Fern.

- V.U. **Panicum Boscii** Poir.
 U. **P. commutatum** Schultes var. **Ashei** (Pearson) Fern.
 U. **P. depauperatum** Muhl. var. **depauperatum**
 V.U. **P. dichotomiflorum** Michx. var. **puritanorum** Svenson
 V.U. **P. dichotomum** L. var. **barbulatum** (Michx.) Wood
 P. **P. sphaerocarpon** Ell.
 V.U. **P. xanthophysum** Gray
 P. **SETARIA ITALICA** (L.) Beauv. var. **ITALICA**. Occurs in several vars. and many forms. For their classification, see Hubbard, F. T. in Am. Journ. Bot. II, 187-188, 1915.
 U. **Cenchrus longispinus** (Hack.) Fern.
 V.U. **Andropogon virginicus** L.
 P. **Sorghastrum nutans** (L.) Nash

CYPERACEAE

- U. **Cyperus filiculmis** Vahl var. **filiculmis**
 U. **C. inflexus** Muhl.
 V.U. **Eleocharis Engelmanni** Steud.
 V.U. **E. obtusa** (Willd.) Schultes var. **ellipsoidalis** Fern.
 P. **E. ovata** (Roth) R. & S.
 U. **E. tuberculosa** (Michx.) R. & S.
 U. **Bulbostylis capillaris** (L.) C. B. Clarke. Perhaps Probable.
 V.U. **Fimbristylis autumnalis** (L.) R. & S. var. **mucronulata** (Michx.) Fern.
 P. **Scirpus acutus** Muhl. Concord River meadows at Bedford.
 P. **S. americanus** Pers. Abundant at Heard's Pond, Wayland.
 U. **S. atrovirens** Willd. var. **atrovirens**
 U. **S. expansus** Fern.
 U. **S. hudsonianus** (Michx.) Fern.
 V.U. **S. Smithii** Gray. Heard's Pond, Wayland.
 U. **Eriophorum gracile** W. D. J. Koch
 U. **Hemicarpha micrantha** (Vahl) Pax. Abundant over large areas of exposed flats at Sandy Pond, Lincoln, during the four-year drought of the mid-1960's.
 U. **Carex artitecta** Mackenz.
 P. **C. atlantica** Bailey
 P. **C. Bicknellii** Britt.
 U. **C. bromoides** Schkuhr
 P. **C. communis** Bailey

- U. *C. Crawfordii* Fern.
- P. *C. crinita* Lam. var. *gynandra* (Schwein.) Schwein. & Torr.
- P. *C. flava* L. var. *flava*
- U. *C. gracilescens* Steud.
- U. *C. HIRTA* L. One of the very few naturalized sedges. Frequent in Essex Co.
- V.U. *C. laxiflora* Lam. var. *serrulata* F. J. Herm. (Lincoln, where the only occurrence recorded from New England.)
- V.U. *C. leporina* L.
- U. *C. leptotrichia* Fern. To be looked for on circumneutral soils, e.g., overlying the Marlboro Formation as at Martha's Point.
- U. *C. limosa* L.
- P. *C. lupulina* Muhl. var. *pedunculata* Gray
- U. *C. pedunculata* Muhl.
- U. *C. prasina* Wahlenb.
- V.U. *C. Pseudo-Cyperus* L.
- V.U. *C. sparganioides* Muhl. Rare. Middl.: Melrose, Woburn; Suffolk County: Oak Is., Revere (formerly).

LEMNACEAE

- V.U. *Lemna valdiviana* Phil.
- P. *Wolffia papulifera* C. H. Thompson. Billerica in Concord River, 1968: hence Probable. Very rare in New England: recorded elsewhere in New England only from Fairfield Co., Connecticut.
- P. *Wolffiella floridana* (J. D. Sm.) C. H. Thompson. Far-rar's Pond, Lincoln, Massachusetts, 1937, which drains into Sudbury River in Concord above Fairhaven Bay. Although this is the *only* record from New England, the presence of the plant in Concord is deemed Probable.

XYRIDACEAE

- U. *Xyris montana* Ries

COMMELINACEAE

- U. *Tradescantia ohiensis* Raf. Perhaps Probable.

JUNCACEAE

- P. *Juncus articulatus* L.
- U. *J. dichotomus* Ell.

- U. *J. effusus* L. var. *Pylaei* (Laharpe) Fern. & Wieg.
- U. *J. tenuis* Willd. var. *anthelatus* Wieg.

LILIACEAE

- V.U. *Allium tricoccum* Ait.
- U. *A. vineale* L.
- U. *Erythronium americanum* Ker
- U. *Smilacina trifolia* (L.) Desf.
- V.U. *Streptopus roseus* Michx.
- U. *Smilax glauca* Walt.

ORCHIDACEAE

- V.U. *Cypripedium Calceolus* L. var. *parviflorum* (Salisb.) Fern.
- V.U. —— var. *pubescens* (Willd.) Correll
- V.U. *Habenaria Hookeri* Torr.
- V.U. *H. macrophylla* Goldie
- V.U. *H. viridis* (L.) R. Br. var. *bracteata* (Muhl.) Gray.
Carlisle: Fernald, 1911.
- V.U. *Spiranthes lucida* (H. H. Eat.) Ames
- V.U. *Corallorrhiza odontorhiza* (Willd.) Nutt.
- U. *C. trifida* Chatelain

SALICACEAE

- U. *SALIX ALBA* L. var. *ALBA*
- U. *S. FRAGILIS* L.
- P. *S. gracilis* Anderss. River meadows: Bedford, Wayland.
- U. *S. PURPUREA* L.
- U. *Populus deltoides* Marsh.

JUGLANDACEAE

- U. *Carya cordiformis* (Wang.) K. Koch

CORYLACEAE

- U. *BETULA PENDULA* Roth
- U. *Alnus rugosa* (DuRoi) Spreng. var. *americana* (Regel)
Fern.
- P. *A. serrulata* (Ait.) Willd. var. *subelliptica* Fern.

CANNABINACEAE

- U. *HUMULUS JAPONICUS* Sieb. & Zucc.
- U. *H. Lupulus* L. Perhaps Probable.

POLYGONACEAE

- U. **RUMEX ACETOSA** L. Lincoln, where abundant at a single station.
- P. **R. DOMESTICUS** Hartm.
- U. **Tovara virginiana** (L.) Raf.
- U. **Polygonum ciliinode** Michx.
- U. **P. erectum** L.

CHENOPODIACEAE

- P. **Chenopodium ambrosioides** L. var. **anthelminticum** (L.) Gray
- U. **C. BOTRYS** L.
- U. **C. GLAUCUM** L.
- P. **C. LANCEOLATUM** Muhl.

AMARANTHACEAE

- P. **Amaranthus albus** L.
- U. **A. CRUENTUS** L.
- U. **A. graecizans** L.
- V.U. **A. SPINOSUS** L.

CARYOPHYLLACEAE

- P. **Stellaria Alsine** Grimm
- V.U. **S. longifolia** Muhl.
- U. **Cerastium arvense** L.
- P. **LYCHNIS FLOS-CUCULI** L.
- U. **SILENE DICHOTOMA** Ehrh.
- U. **SAPONARIA VACCARIA** L.

CERATOPHYLLACEAE

- P. **Ceratophyllum echinatum** Gray

RANUNCULACEAE

- U. **Ranunculus abortivus** L. var. **acrolasius** Fern.
- V.U. **R. acris** L. var. **latisectus** G. Beck
- P. **R. allegheniensis** Britt. Damp rocky woods, sweet soil as on Marlboro Formation.
- V.U. **R. micranthus** Nutt. var. **delitescens** (Greene) Fern.
- U. **R. REPENS** L. var. **ERECTUS** DC.
- U. _____ var. **GLABRATUS** DC.
- U. **R. scleratus** L.
- U. **R. trichophyllum** Chaix var. **calvescens** W. B. Drew
- U. **Thalictrum polygamum** Muhl. var. **hebecarpum** Fern.

- P. **T. revolutum** DC.
- U. **ANEMONE CANADENSIS** L. Considered an escape from cultivation in Middl.
- U. **A. cylindrica** Gray
- V.U. **A. riparia** Fern.

CRUCIFERAE

- P. **DRABA Verna** L. var. **BOERHAAVII** Van Hall
- U. **ALYSSUM ALYSSOIDES** L.
- U. **LEPIDIUM RUDERALE** L.
- U. **CAMELINA MICROCARPA** Andrz.
- U. **C. SATIVA** (L.) Crantz
- P. **BRASSICA JUNCEA** (L.) Coss
- P. **B. KABER** (DC.) L. C. Wheeler var. **PINNATIFIDA** (Stokes) L. C. Wheeler
- U. **B. NAPUS** L.
- U. **B. RAPA** L.
- U. **CONRINGIA ORIENTALIS** (L.) Dumort.
- V.U. **SISYMBRIUM LOESELII** L.
- U. **S. OFFICINALE** (L.) Scop. var. **OFFICINALE**
- U. **ARABIDOPSIS THALIANA** (L.) Heynh.
- U. **DESCURAINIA SOPHIA** (L.) Webb
- V.U. **ERYSIMUM REPANDUM** L.
- U. **RORIPPA SYLVESTRIS** (L.) Bess. Occasional in Middl. but said to be rapidly spreading — fide Stuckey, R. L. in Sida 2: 361–376, 1966.
- U. **BARBAREA Verna** (Mill.) Aschers.
- U. **LUNARIA ANNUA** L. A persistent garden weed in Lincoln.
- P. **Cardamine parviflora** L. var. **arenicola** (Britt.) O. E. Schulz
- U. **C. pensylvanica** Muhl. var. **Brittoniana** Farw.
- U. **Arabis missouriensis** Greene

PODOSTEMACEAE

- U. **Podostemum ceratophyllum** Michx. On rocks in Charles River at So. Natick and in Concord River at No. Billerica; hence perhaps Probable in Concord. However, Thoreau commented: "I have never seen it elsewhere in the river" [than at the Billerica Falls]. Th. J. 12: 253.

CRASSULACEAE

- U. **SEDUM ACRE** L.

SAXIFRAGACEAE

- U. **Parnassia glauca** Raf.
- V.U. **HYDRANGEA PANICULATA** Sieb. Lincoln. See Rh. 31: 18.
- P. **Ribes americanum** Mill. From seven towns in Middl.
- U. **R. glandulosum** Grauer
- V.U. **R. GROSSULARIA** L. Rare.

ROSACEAE

- U. **SORBARIA SORBIFOLIA** (L.) A. Br.
- U. **PYRUS COMMUNIS** L.
- V.U. **Crataegus arnoldiana** Sarg.
 - U. **C. basilica** Beadle
 - U. **C. brumalis** Ashe var. **brumalis**, (*C. iracunda* Beadle var. *brumalis* (Ashe) Kruschke)
 - P. **C. chrysocarpa** Ashe var. **chrysocarpa**
 - P. _____ var. **phoenicea** Palmer
 - U. **C. Dodgei** Ashe
- V.U. **C. Faxonii** Sarg.
 - U. **C. foetida** Ashe, (*C. intricata* Lange var. *Boyntonii* (Beadle) Kruschke)
 - U. **C. fretalis** Sarg., (*C. macrosperma* Ashe var. *matura* (Sarg.) Egglest.)
 - P. **C. intricata** Lange var. **intricata**
 - U. **C. macrosperma** Ashe var. **matura** (Sarg.) Egglest. (*C. fretalis* Sarg.)
 - P. _____ var. **pentandra** (Sarg.) Egglest.
 - P. **C. MONOGYNA** Jacq. Often spreading from cultivation.
 - U. **C. pedicellata** Sarg. var. **pedicellata**
 - U. **C. PHAENOPYRUM** (L.F.) Medic. Introduced from farther south and escaped from cultivation.
 - U. **C. Pinglei** Sarg.
 - U. **C. pruinosa** (Wendland) K. Koch
- V.U. **C. Stonei** Sarg., (*C. biltmoreana* Beadle var. *Stonei* (Sarg.) Kruschke)
- V.U. **C. submollis** Sarg.
 - U. **Fragaria vesca** L. var. **vesca**
 - U. _____ var. **americana** Porter
 - U. **Potentilla intermedia** L.
 - U. **Geum laciniatum** Murr.
- V.U. **Rubus argutus** Link. Doubtfully in Middl.
- U. **R. LACINIATUS** Willd. An escape from cultivation.
- P. **R. setosus** Bigel.

V.U. **Agrimonia pubescens** Wallr.

V.U. **Sanguisorba canadensis** L.

U. **ROSA MICRANTHA** Sm.

U. **Prunus americana** Marsh.

U. **P. AVIUM** L.

U. **P. CERASUS** L.

LEGUMINOSAE

U. **Cassia nictitans** L.

U. **TRIFOLIUM DUBIUM** Sibth.

U. **T. incarnatum** L. var. **elatius** Gibelli & Belli

P. **LOTUS CORNICULATUS** L. No specimen seen from Middl.
but rapidly spreading in eastern Massachusetts, hence
included here.

U. **ROBINIA VIScosa** Vent. An escape from cultivation from
farther south.

U. **Desmodium cuspidatum** (Muhl.) Loud.

P. **D. perplexum** Schub. Numerous towns in Middl.

U. **Lespedeza Nuttallii** Darl. (=*L. Hirta* × *intermedia* ac-
cording to A. F. Clewell.)

U. **L. procumbens** Michx.

V.U. **L. Stuevei** Nutt.

P. **L. violacea** (L.) Pers.

U. **VICIA ANGUSTIFOLIA** Reichard var. **ANGUSTIFOLIA**

U. **V. VILLOSA** Roth

U. **Lathyrus palustris** L. var. **linearifolius** Ser.

U. **Amphicarpa bracteata** (L.) Fern. var. **comosa** (L.) Fern.

LINACEAE

U. **Linum medium** (Planch.) Britt. var. **texanum** (Planch.)
Fern. Lincoln, Waltham.

U. **L. USITATISSIMUM** L. Bedford, Malden.

U. **L. virginianum** L.

OXALIDACEAE

U. **Oxalis stricta** L.

GERANIACEAE

U. **Geranium Bicknellii** Britt.

V.U. **G. carolinianum** L. var. **carolinianum**

U. ————— var. **confertiflorum** Fern.

SIMAROUBACEAE

U. **AILANTHUS ALTISSIMA** (Mill.) Swingle

POLYGALACEAE

- P. **Polygala cruciata** L. var. **aquilonia** Fern. & Schub.

EUPHORBIACEAE

- U. **EUPHORBIA COROLLATA** L. Adventive from farther south.

- U. **E. ESULA** L.

- U. **E. vermiculata** Raf.

ANACARDIACEAE

- P. **Rhus radicans** L. var. **Rydbergii** (Small) Rehd.

AQUIFOLIACEAE

- P. **Ilex laevigata** (Pursh) Gray

ACERACEAE

- P. **ACER PLATANOIDES** L.

- U. **A. PSEUDO-PLATANUS** L.

- U. **A. rubrum** L. var. **trilobum** K. Koch. Perhaps Probable:
occurs in Bedford, but otherwise not recorded from Middl.

RHAMNACEAE

- P. **Rhamnus cathartica** L. (Thor. Herb.)

VITACEAE

- U. **Vitis aestivalis** Michx. var. **aestivalis**. Lincoln and two
other towns.

MALVACEAE

- U. **Malva verticillata** L. var. **crispa** L.

- U. **Abutilon Theophrasti** Michx. Acton, Bedford, Chelms-
ford, and four other towns.

GUTTIFERAE

- U. **Hypericum virginicum** L. var. **Fraseri** (Spach) Fern.

VIOLACEAE

- V.U. **Viola pectinata** Bickn. Carlisle, in drier parts of Concord
River meadows; Stratford, Connecticut.

- U. **V. pensylvanica** Michx. var. **leiocarpa** (Fern. & Wieg.)
Fern.

- U. **V. sagittata** Ait.

- U. **V. triloba** Schwein.

THYMELAEACEAE

- U. **DAPHNE MEZEREUM** L.

ELAEAGNACEAE

- U. **ELAEAGNUS UMBELLATA** Thunb. Lincoln, where sponta-
neous in a thicket.

LYTHRACEAE

- U. **Decodon verticillatus** (L.) Ell. var. *verticillatus*
- U. **LYTHRUM ALATUM** Pursh. Adventive from the south.
- U. **L. SALICARIA** L. var. *TOMENTOSUM* (Mill.) DC.

ONAGRACEAE

- U. **Ludwigia sphaerocarpa** Ell. var. *macrocarpa* Fern. & Grisc. Perhaps Probable: Concord River bank at Bedford and Billerica below Jug Island where common fide E. S. Hoar. Otherwise rare in New England.
- P. **Epilobium glandulosum** Lehm. var. *adenocaulon* (Haussk.) Fern.
- U. **E. hirsutum** L.
- U. **E. palustre** L. var. *oliganthum* (Michx.) Fern.
- P. **Oenothera biennis** L. var. *pycnocarpa* (Atkinson & Bartlett) Wieg. Common.
- U. **O. cruciata** Nutt.
- U. **O. LACINIATA** Hill. Adventive from farther south.

HALORAGACEAE

- V.U. **Myriophyllum exalbescens** Fern.
- U. **M. tenellum** Bigel. Heard's Pond, Wayland, and three other towns.
- V.U. **Proserpinaca pectinata** Lam. Tophet Swamp, Carlisle.

ARALIACEAE

- P. **Panax trifolius** L.

UMBELLIFERAE

- U. **Hydrocotyle umbellata** L.
- U. **Osmorhiza Claytoni** (Michx.) C. P. Clarke
- U. **CONIUM MACULATUM** L.
- U. **Cryptotaenia canadensis** (L.) DC. Beaver Brook Reservation, Waverley; Belmont; Groton.
- U. **Aethusa Cynapium** L. Lexington, Waltham, etc.: perhaps Probable.
- P. **Heracleum maximum** Bartr.

ERICACEAE

- V.U. **Epigaea repens** L. var. *repens*
- U. **Gaultheria hispida** (L.) Bigel. In Thor. Herb., n.c.d., but probably not from Concord.
- U. **Vaccinium angustifolium** Ait. var. *angustifolium*

- P. — var. **nigrum** (Wood) Dole
P. **V. corymbosum** L. var. **albiflorum** (Hook.) Fern.

PRIMULACEAE

- U. **Lysimachia ciliata** L. Unrecorded from Middl. The specimen in Thor. Herb. was collected in the Maine woods in 1853.

- P. \times **L. producta** (Gray) Fern.

- V.U. **Hottonia inflata** Ell. Not reported in Middl. west of Lexington-Belmont-Winchester, except for a single casual plant that appeared on edge of Kalmia Bog, Conantum, Concord, in 1968, doubtless arising from a seed casually introduced into a "bog garden."

OLEACEAE

- U. **Chionanthus virginicus** L. Abundantly naturalized in open woods and roadside thickets in a restricted area in Lincoln; also from three other towns in Middl.

- P. **LIGUSTRUM VULGARE** L.

APOCYNACEAE

- U. **Apocynum sibiricum** Jacq.

CONVOLVULACEAE

- V.U. **Cuscuta pentagona** Engelm.

POLEMONIACEAE

- U. **PHLOX PANICULATA** L. Uncommon. Escaped from cultivation from farther south and west.
U. **P. SUBULATA** L. Uncommon. Escaped from cultivation from farther west.

BORAGINACEAE

- U. **SYMPHYTUM ASPERUM** Lepechin
U. **S. OFFICINALE** L.
P. **LITHOSPERMUM ARVENSE** L.
U. **CYNOGLOSSUM OFFICINALE** L.
U. **MYOSOTIS ARvensis** (L.) Hill

LABIATAE

- U. **Teucrium canadense** L. var. **canadense**
U. **MARRUBIUM VULGARE** L.
U. **PHYSOSTEGIA VIRGINIANA** (L.) Benth. Indigenous south and west, an escape from cultivation in Middl.

- P. *GALEOPSIS TETRAHIT* L. var. *BIFIDA* (Boenn.) Lej. & Court.
- U. *Stachys palustris* L. var. *palustris*
- U. *MONARDA FISTULOSA* L. var. *FISTULOSA*. Escaped from cultivation in Middl.
- U. *Satureja vulgaris* (L.) Fritsch var. *neogaea* Fern.
- U. *Pycnanthemum verticillatum* (Michx.) Pers.
- U. *Lycopus rubellus* Moench
- U. *MENTHA CARDIACA* Baker
- U. *M. GENTILIS* L.
- P. *M. PIPERITA* L.
- V.U. *Collinsonia canadensis* L. var. *canadensis*

SOLONACEAE

- P. *SOLANUM NIGRUM* L. Occasional in numerous towns in Middl.
- U. *S. ROSTRATUM* Dunal
- U. *LYCIUM HALIMIFOLIUM* Mill. Lincoln, etc.
- V.U. *HYOSCYAMUS NIGER* L.
- U. *Datura STRAMONIUM* L. var. *STRAMONIUM*

SCROPHULARIACEAE

- U. *VERBASCUM BLATTARIA* L.
- U. *V. SPECIOSUM* Schrad. Lincoln, Eator #5694, 1964; Lexington, A. F. Tryon, 1965. Spontaneous at both places.
- P. *Scrophularia marilandica* L. Marlboro, Bedford, Lexington, and three other towns in Middl.
- U. *Lindernia dubia* (L.) Pennell var. *riparia* (Raf.) Fern.
- U. *VERONICA CHAMAEDRYS* L.
- P. *Gerardia flava* L. Specimen in Thor. Herb. as *G. quercifolia* Pursh but n.c.d., and probably collected in Concord.
- V.U. *G. pedicularia* L. var. *intercedens* (Pennell) Fern. Rare. Near northern limit of range at Bedford.
- P. *G. virginica* (L.) BSP. Specimen in Thor. Herb. as *G. flava* L. but n.c.d., and probably collected in Concord.
- U. *Melampyrum lineare* Desr. var. *pectinatum* (Pennell) Fern.

BIGNONIACEAE

- V.U. *CATALPA BIGNONIOIDES* Walt.

OROBANCHACEAE

- U. **Epifagus virginiana** (L.) Bart. Parasitic on roots of Beech, a tree which is scarce in Concord.
- V.U. **Conopholis americana** (L.) Wallr.

PLANTAGINACEAE

- U. **PLANTAGO LANCEOLATA** L. var. **SPHAEROSTACHYA** Mert. & Koch

RUBIACEAE

- P. **Galium Aparine** L.
- V.U. **G. boreale** L. var. **boreale**. For comment on nomenclature, see Fl. N. E. p. 499.
- V.U. —— var. **hyssopifolium** (Hoffm.) DC.
- U. **G. triflorum** Michx. var. **asprelliforme** Fern.
- U. **Houstonia longifolia** Gaertn. Perhaps Probable: recorded in Middl. from Waltham, Lexington, Woburn, and seven other towns eastward. Specimens in Thor. Herb. from "Waltham" and "Bear Hill," Lincoln.

CAPRIFOLIACEAE

- U. **Lonicera canadensis** Bartr.
- P. **L. TATARICA** L.
- V.U. **L. villosa** (Michx.) R. & S. var. **calvescens** (Fern. & Wieg.) Fern.
- V.U. —— var. **Solonis** (Eat.) Fern.
- U. **SYMPHORICARPOS ORBICULATUS** Moench. Introduced from south and southwest and escaped from cultivation.
- U. **Sambucus pubens** Michx. Indigenous in at least five towns in Middl., including Malden, Newton, Sherborn. Introduced in Concord by Minot Pratt; station unknown. See Rh. 1: 171.

CAMPANULACEAE

- U. **Campanula uliginosa** Rydb.
- P. **Lobelia Cardinalis** L. forma **alba** (Eat.) St. John
- V.U. **L. Kalmii** L. See comment under this species in list of Excluded Species, p. 49.
- U. **L. Dortmannia** L. Occurs in six towns in Middl., but apparently absent from Walden, White, and Bateman's ponds.

COMPOSITAE

- V.U. **Eupatorium purpureum** L.

- V.U. **Solidago Elliottii** T. & G. var. **ascendens** Fern.
 P. **S. rugosa** Ait. var. **sphagnophila** Graves
- V.U. **S. squarrosa** Muhl.
 U. **S. tenuifolia** Pursh var. **tenuifolia**. Perhaps Probable;
 occurs in Weston, Wayland, Holliston, Sherborn.
 U. **Aster Blakei** (Porter) House
 U. **A. johannensis** Fern.
- V.U. **A. macrophyllus** L. var. **pinguifolius** Burgess
 U. **A. nemoralis** Ait.
 U. **A. novi-belgii** L. var. **elodes** (T. & G.) Gray
 P. **A. pilosus** Willd. var. **demotus** Blake
 P. **A. puniceus** L. var. **compactus** Fern.
 U. **A. spectabilis** Ait.
 U. **Erigeron philadelphicus** L.
 P. **Antennaria canadensis** Greene
 U. **A. munda** Fern.
 U. **A. petaloidea** Fern.
 U. **Gnaphalium Macounii** Greene
 U. **AMBROSIA TRIFIDA** L.
- V.U. **Xanthium chinense** Mill. Heard's Pond, Wayland: still
 present in 1957, when station last visited.
- V.U. **Helianthus decapetalus** L. North Middl. only: Lowell,
 Tewksbury.
- V.U. **Coreopsis rosea** Nutt. Sudbury, So. Framingham, Natick,
 Winter Pond, Winchester.
 P. **Bidens connata** Muhl. var. **petiolata** (Nutt.) Farw.
 U. **B. coronata** (L.) Britt. var. **brachyodonta** Fern.
 U. **GALINSOGA PARVIFLORA** Cav. Not to be confused with
 the very common *G. ciliata*.
 U. **ANTHEMIS ARvensis** L. var. **ARvensis**
 U. **CHRYSANTHEMUM BALSAMITA** L.
 U. **C. PARTHENIUM** (L.) Bernh.
 P. **TUSSILAGO FARFARA** L. Occasional in numerous towns in
 Middl.
 P. **Erechtites hieracifolia** (L.) Raf. var. **intermedia** Fern.
 U. **Senecio obovatus** Muhl.
- V.U. **S. pauperulus** Michx. var. **Balsamitae** (Muhl.) Fern.
 U. —— var. **praelongus** (Greenm.) House
 P. **S. VULGARIS** L.
 P. **ARCTIUM LAPPA** L.
- V.U. **A. TOMENTOSUM** Mill.

- U. **Cirsium discolor** (Muhl.) Spreng.
- P. **C. muticum** Michx.
- U. **ONOPORDUM ACANTHIUM** L.
- U. **CENTAUREA JACEA** L.
- U. **LAPSANA COMMUNIS** L. Occasionally locally abundant on roadsides and waste places.
- P. **Sonchus oleraceus** L.
- P. **Lactuca canadensis** L. var. **canadensis**
- P. _____ var. **obovata** Wieg.
- U. **L. hirsuta** Muhl. var. **sanguinea** (Bigel.) Fern.
- U. **CREPIS CAPILLARIS** (L.) Wallr. Uncommon (rare?), but locally frequent elsewhere.
- P. **HIERACIUM FLORIBUNDUM** Wimm & Grab. Doubtless overlooked in Concord.

PLATES

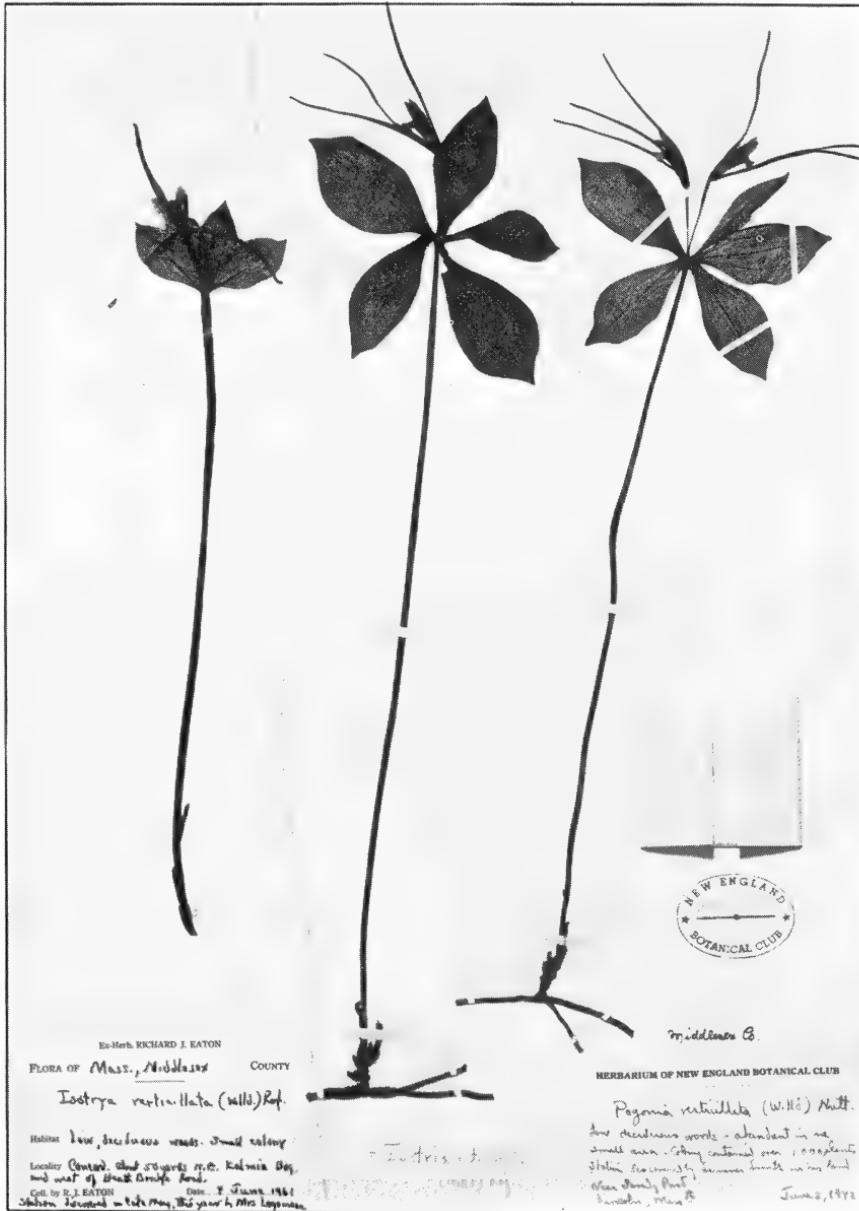
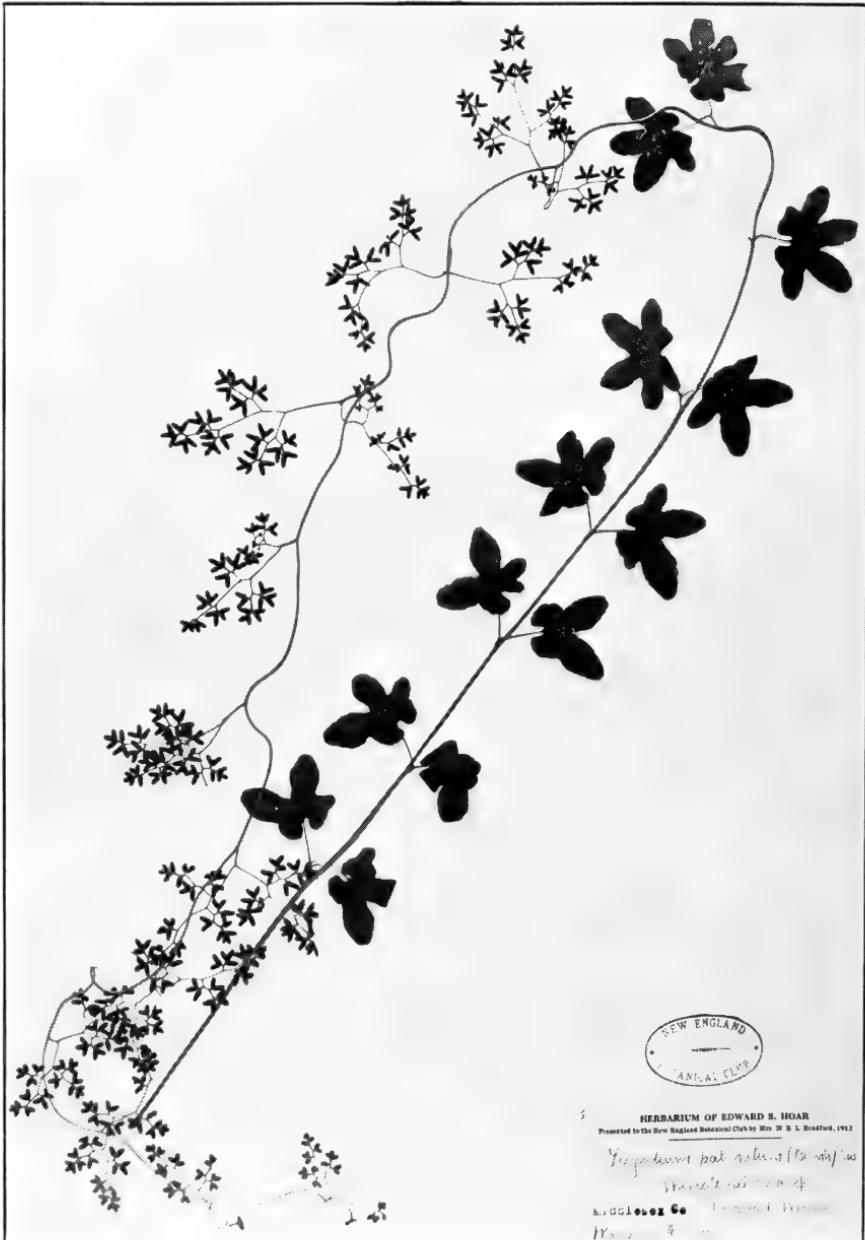


Plate 1. WHORLED POGONIA (*Isotria verticillata*) — There is some confusion regarding Thoreau's statement that his sister Sophia found this rare orchid in Hubbard's Second Wood, since there is no specimen to support it. In doubt also is the exact location of Hubbard's Second Wood, but it is thought to be Kalmia Woods in Conantum, the site of Mrs. E. P. Logermann's recent discovery of a Whorled Pogonia and the origin of this photograph. (See page 98.)



HERBARIUM OF EDWARD S. HOAR

Presented to the New England Botanical Club by Mrs. M. B. L. Bradford, 1912

Lygodium palmatum (L.) Willd.
var. palmatum
M. B. L. Bradford
HARRIS CO. - D. C. Heath & CO.
1912

Plate 2. CLIMBING FERN (*Lygodium palmatum*) — This locally rare fern-ally was first discovered by Thoreau in 1857. It was last seen by Wilfred Wheeler about 1920. (See page 57.)



Plate 3. BROAD-LEAVED PANIC GRASS (*Panicum latifolium*) — Although this handsome perennial is rather common throughout much of New England, it is seldom encountered in Concord. (See page 77.)



Plate 4. CAREX PRAIREA — The provenance of this interesting specimen may thus be summarized: Found by Thoreau on 8 June 1859 in the meadow under Clam Shell Bluff; its collection by him authenticated by *his* handwriting on the slip pasted over the specimen; annotated by E. S. Hoar in his handwriting as No. 104 from Thoreau's Herbarium; presented by Hoar's daughter, Mrs. M. B. L. Bradford, to the New England Botanical Club; labelled by a student under the direction of Prof. M. F. Fernald. Notice the successive changes of nomenclature. It may be speculated that leachings from the ancient Indian shell-heaps provided the calcium ions needed by this locally very rare sedge. (See page 83.)



HERB. W. DEANE.

EX HERB. H. MANN

Habenaria L.

Flora of Northern United States.

Platanthera blephariglottis (L.) R. Br.*Habenaria blephariglottis* (L.) R. Br.

July 2, 1900.

E. B. L. Hosmer

Plate 5. WHITE FRINGED ORCHIS (*Habenaria blephariglottis*) — The botanically precocious Horace Mann, Jr. collected this specimen of an uncommon orchid in the year following his and Thoreau's return from Minnesota. Alfred Hosmer was probably the last person to have seen this beautiful plant growing in Concord about seventy-five years ago. (See page 97.)



Plate 6. SICKLEPOD (*Arabis canadensis*) — This plant is one of the six species of the mustard family native to Concord. It is restricted to sweet soils such as occur at Martha's Point. (See page 125.)



Plate 7. LABRADOR TEA (*Ledum groenlandicum*) — "To Miles' Swamp. Discover the *Ledum* . . . quite abundant just east of the small pond hole. . . I had a presentiment that I should find the ledum in Concord. . . in the case of the most interesting plants which I have discovered in this vicinity, I have anticipated finding them perhaps a year before discovery." (See page 154.)



as clp. as verticillata
Concord. Cliff May '79
Concord, Mass.

HERRARIUM OF EDWARD S. HOAR

Presented to the New England Botanical Club by Mr. M. S. L. WOODFORD, 1912

Asclepias verticillata L.

Concord, Mass.

E.S. Hoar

EX-HERRARIUM OF RICHARD J. EATON
FLORA OF MASSACHUSETTS COUNTY

Asclepias verticillata

Habitat Dry rocky slope over 17,000 ft. high

Locality Sweet Martha's Point

Collected July 10, 1912

Coll. by R. J. EATON

Date Oct. 15, 1912

Plate 8. WHORLED MILKWEED (*Asclepias verticillata*) — Formerly plentiful at Martha's Point, the last known survivor of a slowly diminishing population apparently succumbed to the long drought of the early 1960's. (See page 161.)



Plate 9. PAINTED-CUP (*Castilleja coccinea*) — The disappearance of the once abundant, brilliantly scarlet Painted-cup is a mystery. The suggestion that seed-production may have been prevented by an extended period of early mowing for green forage fails to take into account Thoreau's observation that somewhat dwarfed plants "first appear on the side of the hill in drier ground . . ." (See page 169.)

NEW ENGLAND
JULY 2 1928
BOTANICAL CLUB



PRESENTED TO THE GRAY HERBARIUM
BY
DR. J. W. CUMMING

HERB JAS LUND
Phryma leptostachya A.
Saxifragaceae
Conecasa, Mass.
Prof. Daniel 21. 3. 1928

Plate 10. LOPSEED (*Phryma Leptocephala*) — Another member of the exclusive fraternity inhabiting the sweet soil of Martha's Point. Although not seen in recent years, dormant seeds produced prior to the long drought of the early 1960's may yet rescue this locally rare plant from oblivion. Surprisingly, Thoreau overlooked it. (See page 171.)



COLLECTION OF RICHARD J. EATON
FLORA OF MASSACHUSETTS, MIDDLESEX COUNTY

Liatris borealis Willd.

Habitat sandy flats and R.R. banks
Locality beautiful east of Littleton, Concord

PLATE 11 May 17, 1938



Plate 11. BLAZING-STAR (*Liatris borealis*) — When, in 1852, Thoreau wrote of finding "*Liatris* by Caesar's Well," he was emerging from the philosophical "me-thinks" stage of his botanical development. Scientific names in reckless profusion were now obtruding willy-nilly on the pages of the Journal. For many years the northeastern *Liatris borealis* was confused with the more southerly *L. scariosa*, hence Thoreau's use of the latter name. (See page 177.)

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Additions to the Catalog,
With Field Notes, Label Data, and
Location of Voucher Specimens

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	Hubbard's Brook	G6
	Hubbard's Close	G8
(69)	Hubbard's Grove	G5
	Hubbard's Hill	C7
(70)	Hunt's, or Red, Bridge	E6
(71)	Hunt's Pasture	C7
(73)	Indian Field	E6
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(77)	Laurel Glen	H6
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(78)	Ledum Swamp	E6
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(79)	Lime-kiln	G6
(80)	Lime Quarry	G6
(81)	Linnaea Hills	H4
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(82)	Little Truro	G5
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(84)	Mantatauk Point or Rock	E6
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(85)	Merrick's Pasture	F6
(86)	Miles's Mill, Warren	H4
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(95)	Painted-Cup Meadow	G6
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(110)	Shrub Oak Plain	J7
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(116)	Tabell's Spring	H5
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(117)	Thoreau's Boat-Landing	E10
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(119)	Thoreau's Home in the Village	H7
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(127)	Wheeler's Swamp	F6
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(129)	Willow Island	E6
	Yellow Birch Swamp	B7

MAP OF
CONCORD, MASS.
Showing Localities mentioned by
Thoreau in his Journals

Compiled by Herbert W. Gleason
1906

SCALE OF MILES

